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ABSTRACT

This annual report discusses several topics related to the work of the Research and Clinical Center for Child Development. Six topics are covered in the report. The articles are: (1) "Development of Intentional Behavior in Early Infancy" (Hongtu Chen); (2) "An Investigation of the Differences of Social Space in the Playroom: Through Analysis by the Quotient of 'Associated' Behaviors" (Katsumi Kanazawa and others); (3) "Let Your Toddler Journey to Separation: Child Separation and Reconstruction of Playful Interactions in the Japanese Mother and Child" (Sigeru Nakano); (4) "Toward a Theoretical Development of Physical Activities for Children with Handicaps: Moter, Movement, and Action" (Atsusi Nanakida); (5) "Posture As a Dynamic Stable State of a Body" (Norimasa Yamada); and (6) "Mentors for Japanese College Students" (Kunio Wakai). References are included with each article. (AP)

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RESEARCH AND CLINICAL CENTER FOR CHILD DEVELOPMENT

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1993-1994
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DEVELOPMENT OF INTENTIONAL BEHAVIOR IN EARLY INFANCY

Hongtu Chen

University of California at Berkeley

Abstract

The recently revived interest in the development of intentional behavior can be traced back to one century ago when there was an important debate between Associationism and Voluntarism. Associationist theories emphasize on the aspect of integration in developing intentional behavior. The Voluntarist theories emphasize on how the child's psychodynamic system, such as desire, affect, perception, and action, differentiates as a result of interaction between organism and environment. Such a contrast of different ways of conceptualizing the course of early development can be seen in more recent theories. Piaget hypothesizes that processes underlying the early development of intentional behavior are generalizing assimilation and apprenticeship, which leads toward a more coordinative and integrated level of functioning. Bower and Gibson posit that infants begin life with more general and undifferentiated states and become more specific and differentiated throughout development. In the end, an attempt was made to reconcil both Piagetian and Bowerian views on the development of intentional behavior. It is proposed that infants start with an abstract sense about the function of behavior. They become more discriminating in selecting an intentional behavior with development, and later on are more active in interacting with the environment which enable them to invent new effective behavior.

Intentionality is one of the basic concepts that have been used by psychologists who attempt to explain the active nature of behavior in an organism. Such an attempt of researchers existed one hundred years ago when psychology just emerged as a scientific discipline. The interest in intentionality decreased with the movement of Behaviorism in psychology, and has been greatly revived especially during the last decade in several interrelated fields such as philosophy (Searle, 1983, 1984), cognitive science (Bechtel, 1988), and developmental psychology (Lewis, 1990).

The issues about the origin and early development of intentional behavior in human beings fascinate developmental psychologists for at least two reasons. One, it is often observed that human adults in general are more advanced than children in their

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Request for reprints should be sent to the author at: Department of psychology, University of California, Berkeley, CA 94720, USA.

I thank Professor Joseph Campos for many helpful discussions.

intentional characteristics of their behavior. Human adults are more goal-oriented, planful, and resourceful than infants in activities, which in most cases helps them interact with the environment in a more adaptive way. Two, how to conceptualize the origin and the developmental process of intentional behavior is an important criterion for evaluating the strength and weakness of basic models of psychological development. For example, the biological model may assume that intentionality is not a necessary concept, since behavior can be attributed to the influence of biological or genetic factors. The behavioristic model may argue that all seeming intentional behavior can be explained by the past experience in which the association between the intended target in the environment and the basic biological desire was established. A psychodynamic model may assume that all behaviors are intentional with their origin in biological drive and social-emotional history. The constructivist model posits that intentionality graudally develops as an organism actively participates, with desire and plan, in interactions with the environment.

In this article the analysis will focus on Piaget's constructivist model because it is so far the best and most detailed theory on the early development of intentional behavior. However, to better understand Piaget's position, it is necessary to review a debate that occurred before Piaget.

1. Two developmental views of intentional behavior

Around the turn of this century, there was a debate between Associationism (e. g., Bain, 1859) and Voluntarism (e. g., Wundt, 1894, 1907) about the development of intentional or volitional behavior. In essence, the Associationst theory of the development of volitional behavior is based on the following principles. (1) Organisms initially are equipped with involuntary or reflex behavior. (2) Repetition of the reflexive behavior that leads to some result in the environment will establish the association between action and its result, which strengthens the habitual behavior. (3) With a series of experiences, the associative connection becomes reversible: the end (e. g., satiation) will become a goal that is elicited by the stimulus and will direct the associated means behavior (e. g., searching for food) (Ebbinghaus, 1902). (4) Finally, actions become associated with participation of reasoning and representation about the desired object, which creates the intentional or volitional behavior. The general developmental sequence first was proposed by philosophers, such as Bain (1859) and Herbart (1889), and later on was elaborated by developmental psychologists, such as Piaget (1952). The Associationist theory of the development of intentionality in general attempts to attack the issue of the connection from non-intentional behavior to intentional behavior by proposing some intermediate processes, such as habitual behavior as Herbart (1889).

The Voluntarist theory of the development of intentional behavior is based on the following principles. (1) Organisms are born with drives that generate a particular kind of impulsive behavior that is undifferentially accompanied by an affective state (Wundt, 1907). (2) Repetition or practice of this primary drive-generated behavior leads to the "heterogony of ends" (Wundt, 1904): the action on the environment will have unintended consequences, which will modify and expand the original intended end of the action in a situation. Later on, the same situation may in turn generate a multiplicity of

affective states that are undifferentially associated with action tendencies in a situation. To transform this multiple action tendencies into an overt behavior, the organism has to make a choice, which is the first version of volitional behavior. (3) Opposite to the direction of development toward multiplicity and differentiation, repetition of a drive -generated behavior or volitional behavior also results in formation of automaticity or habit, which reduces or eliminates the element of choice and affect, therefore, volition (Wundt, 1904). (4) The simultaneous development of the cognitive availability of a multiplicity of movements and effects makes possible the fully formed voluntary activity. Nevertheless, in Wundt's system, the affective components never disappear in the course of development of volitional activity. (5) Both Wundt (1907) and James (1890) pointed out the importance of obstacle or difficulty in developing voluntary or will behavior. According to James (1890, pp 1166), "the essential achievement of will, when it is most voluntary, is to attend to a difficult object and hold it fast before the mind."

In sum, both Associationist theories and Voluntarist theories of the development of intentionality posit that (a) human infants begin their life with non-intentional behavior, (b) the full form of intentionality depends on the higher cognitive capacity (e. g., representation) that can represent objects or goals in the mind, and (c) the development of intentionality largely depends on the organism's interaction with the environment. However, one major difference between these two theories lies in their views about the direction of development. The Associationist emphasizes that various elements (e. g., behaviors, associations between behavior and its results, and representations) integrate or coordinate with each other in developing intentional behavior. In contrast, the Voluntarist theory views the development of intentionality in general as a continuum and a process in which infants' psychodynamic system, such as desire, affect, perception, and action, differentiates as a result of interaction between the organism and the environment.

These two ways of conceptualizing the development of intentional or volitional behavior provide us with two different pictures of intentional development. The tension between them did not abate even after Piaget (1952) proposed his theory of child development half a century later, although to some extent Piaget's theory synthesized both Associationist and Voluntarist theories of the development of children's intentional behavior.

2. Piaget's Synthesis

Piaget has offered the most coherent developmental model of intentional behavior. He believes that the infant begins life without intentionality and fully constructs it around the middle of the second year of life. His theory on the development of intentional behavior is a successful synthesis of both Associationist theories and Voluntarist theories. From Associationist theories, Piaget adopted the following points. (a) Infants are born with reflex schemes, through which infants interact with the environment. (b) Practice of the reflexive behavior will generate a habit-like activity, such as the secondary circular reactions. (c) It is symbolic representation that brings the organism into a level at which cognitive intentionality comes into being. Piaget (1952,

1954) also used some of concepts that appeared in Voluntarist theories of intentional development. For example, (a) Piaget believes that infants are born with desires, although the desire, in his view, exists in a form of assimilatory mechanism, i. e., infants display a compelled tendency to repeat the previous behavior. (b) The concept of "heterogony of ends" is reflected in his accommodation mechanism by which the schemata structure expands as a result of action upon the environment. (c) The importance of obstacle in developing intentional behavior has also been elaborated in Piaget's theory.

For Piaget, although the full display of intentionality does not occur until the middle of the second year of life, the first sign of intentional behavior, which he also called "intelligent behavior", emerges at Stage IV, somewhere during the second half of the first year of life. He noticed that intentional behavior differs from sensorimotor habit, such as secondary circular reactions, in that an intentional behavior involves an attempt to overcome obstacles and maintain the direciton toward the original goal. Piaget (1952, pp 226) writes, "Intention exists, that is to say, consciousness of a desire to the extent that the assimilatory schema set in motion by contact with the object, is opposed by an obstacle and thereafter only is made manifest in the form of a tendency and not of immediate realization."

He further says, "it is therefore the dissociation of means and ends, due to intervening obstacles, which creates intention and puts the present behavior pattern in opposition to simple habits." (Piaget, 1952, p. 226). In the example he described, when an infant is trying to reach an interesting object and blocked by a pillow, the infant pushes away the pillow with one hand and reaches the object with another one. The behavior of pushing away the pillow, as a secondary circular reaction, is considered as a familiar scheme that has been successfully practiced in other situations. Applying familiar scheme in a new situation is an indication of the dissociation of means and ends.

In general, according to Piaget, a behavior is considered intentional and therefore "intelligent", if it meets the following three criteria: (1) Desire: the infant has a desire or goal in mind and does not discover it accidentally as in Stage 3, (2) Obstacle: an obstacle arises which prevents direct attainment of the goal and necessitates some kind of indirect approach, and (3) substitution: to overcome the obstacle, the infant employs an alternative behavior (means) which serves the same function (ends) but differs from that employed previously (Ginsburg & Opper, 1988).

The substitution process in which an alternative behavior replaces or integrates with the behavior that is blocked by the obstacle is a type of coordination of two schemes. According to Piaget, there are at least two principles guiding the process of finding a new means behaivor. One, for younger infants (e. g. , infants at Stage IV), intentional substitution is based on generalizing assimilation. First, infants apply a secondary circulatory scheme in a new context where the interesting event is the same as the event that used to be part of the practiced secondary circular reactions in a previous context. Take the example we mentioned before, when a pillow blocks an infant's reaching toward a toy, the pillow as an interesting event in the environment will remind the infant of the pushing-pillow behavior, a previous successful secondary circular reactions. Younger infants seem to have the ability to code the function of a

behavior and find an alternative behavior in the new context based on the coded function if a behvior with the same function becomes ineffective.

Another principle is the procedure called "apprenticeship". For older infants (e. g., at Stage V), when the existing schema cannot reach the goal, infants will gradually modify a behavior so that the result of each modification will gradually lead to the desired object. For example, when an infant shakes a string to generate a mobile, if the string sags and the previous successful shaking does not generate the expected mobile movement, an infant at Stage V may gradually stretch the string more and more and eventually learn that stretching the string is the way to achieve the goal. The direction of such modification of behavior is guided by the tendency to assimilate the event that only constitutes moderate novelty as compared with the event generated by the previous (modified) behavior. At stage VI, this external groping process is internalized and the observer may see that a new means behavior will suddenly be invented and solve the problem.

In Piaget's model of intentional development, the fundamental mechanism underlying the process of intentional substitution is assimilation, a tentency to incorporate another behavior of functional equivalence. Such an emphasis on integration has been challenged by other theoreticians.

3. Alternatives to Piaget's theory

As we mentioned earlier, Piaget synthesized two rivaling theories — the Associationist theory vs. the Voluntarist theory — on the development of intentional behavior. However, Piaget only partially accepted the Voluntarist theory by rejecting differentiation as a primary developmental process. Piaget leans towards the Associationist theory and views development as a process toward more and more integrated or coordinated behavior, rather than a course of differentiation.

In the recent years, some theoreticians (Bower, 1974; Gibson, 1969), on the other hand, propose that development may in general occur in a direction from undifferentiated state to a more specific and differentiated state. Differentiation and specification as a developmental trend has found its evidence in perceptual and motor development (Bornstein, 1987; Bower, 1974, 1982; Thelen, 1983). In terms of concepts relevant to intentional processes, it is believed that infants begin life with a motive towards self-efficacy (White, 1969). According to these researchers, it is very likely that information of efficacy conveyed in an amodal form of contingency is more detectable to the younger infant than the information specified by the concrete features of an object in the environment (Bower, 1989). If so, a younger infant may code efficacy as the function of behavior, whereas an older infant may code the specificity of events as the function of the behavior. In other words, in the developmental course, infants first care about whether a behavior is efficient in generating an event or not, and later on attend to what exactly a behavior is efficient about. Although such a position does not refute Piaget's general notion that intentional substitution is based on assimilation, the emphasis focuses on the role of differentiation in developmental course. According to this theory, we may predict that when a means behavior is no longer effective due to the obstacle, a younger infant is more likely to apply an alterna-

tive behavior as long as the behavior was previously successful, regardless of whether the specific result generated by the behavior is the same as the target event in the present situation. However, when the infant grows older, with his perception and memory becoming more discriminative, he will only apply an alternative behavior that is closely relevant to the present task.

4. Conclusion

It is possible that both Piaget and Bower are partially correct. These two views of the development of intentional behavior may be reconciled into the following developmental progression. (1) When intentional behavior first emerges as an intelligent adaptation to environmental change, infants may only have an abstract sense about the function of behavior. When a behavior becomes ineffective due to environmental change, the infant will retrieve any behavior from memory that used to be effective in the past, regardless of the specific consequence of each behavior. (2) With development, in order to adapt to the environmental change in a more efficient way, infants become more discriminating in identifying the functional equivalence and only select alternative behaviors that used to generate exactly the same consequence. (3) Later on, children become more active in interacting with the environment and sensitive in adjusting their own behavior contingent with the changing result of the precious behavior. Such experimentation leads to invention of the new effective solution. Eventually, this experimentation process will be internalized and a new invention will come into being through symbolic thinking.

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AN INVESTIGATION OF DIFFERENCES IN SOCIAL SPACE IN THE PLAYROOM : THROUGH ANALYSIS BY THE QUOTIENT OF 'ASSOCIATED' BEHAVIOR

Katsumi Kanazawa, Emiko Gotoh
Hokkaido University
and Mamoru Gotoh
Hokkaido University of Education-Sapporo Campus

In this research which we try to clarify characteristics of children's 'associated' behavior depending on differences in make-up of therapist team, we investigate functions of these therapist's groups. Here two groupes are formed. One is a team which consists of two students learning the Behavioral Space Therapy along with their guidance instructor (this is termed the 'therapist team' below). The other team consists of three mothers of their object (target) children (the 'mother team'). In this research our aim is to clarify characteristic differences in children's 'associated' behavior in an instructional situation by these teams, with comparison and analysis by the quotient of 'associated' behavior. In this research, the six children were the object of scheduled experimental group therapy. These children all belong to the same special class, so a class member corresponds exactly to the instructional object group. The instructional space consisted of the CS ; (Communicative Space) set up in the center of an 8m square playroom. The CS consisted of a square (244cm × 244cm) 'stage' 25cm in height, and on top of that a 180cm diameter round 'stage' which was also 25cm in height. Toys were limited to only large size blocks which could be assembled and moved. For bacground music, the same music tapes were used for both groups from the beginning to the end. The instructional setting of the therapist team is characterized by a higher 'associated' behavioral relationship in CS activity (located in the center of the playroom), and this relationship is lower in RS (Round Space) activity area (which surrounds CS). Therefore, with the therapist team it is considered that the therapists strengthened the supportive functions of children's 'associated' behavior in the CS, which is a smaller space than the much wider RS space. Characterisitic differences of both teams were also exposed in the results of the 'associated' behavior quotient when the full therapy was broken into the two parts. Mention was made about the tendency with the mother team for the 'associated' behavior quotient to decline from the first half of therapy to the latter half, while with the therapist team it rose. The increase in 'associated' behavior from the first half to the latter half with the therapist team is assumed that 'associated' behavior of each constituent member at the beginning of therapy becomes a reference point, which was condensed as a whole group activity as time passes.

Key words : Behavioral Space Therapy ; The Behavioral Space Analysis ; The Quotient of ' Associated' Behavior

Introduction

When one thinks about the meaning of an environment in which people try to give best teaching to the handicapped children, two topics come to mind. The first is "how to make a responsive environment" and another involves "the composition of the structured spatial surroundings". Traditional teaching styles emphsize the teacher's guidance as a "provider of stimulation". In order to activate children's communicative behavior, however, the two things most needed are the child's spontaneous behavior and a space where the children can express themselves freely. Therefore, in order to accomplish these tasks, it is required to respond in a positive manner to children's behavior, and also to make up for children who can not sufficiently express themselves, and finally to give some meaning to their behavior in the context of the particular environment offerd by the therapist. Moreover, "a scheme to lay out the playroom space" is necessary to give direction for indirectly focusing children whose attention tends to wander, thus making them more stable.

Based on our ealier studies, which implemented the tasks mentioned above, we have developed a unique methodology for group therapy of handicapped children, and had the opportunity to study some early research results. This has been promoted as a systematic tool for daily clinical activity, therefore it is termed "Behavioral Space Therapy" (Gotoh, Ogasawara, Gotoh, & Fukuhara, 1983, 1984). In this therapy method, interactive-type behavior (i.e. that which occurs in a situation in which time and space are shared with others) is assigned a high priority, and the task of actually setting up a space that promotes such behavior for children was undertaken. In this therapy method the following three items form the basic framework of the environment (Gotoh, 1993).

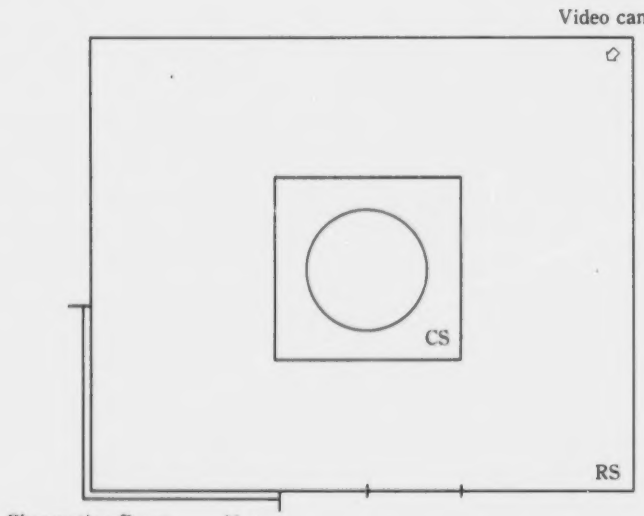


FIGURE 1 Schematic Layout of the Behavioral Space

(1) Physical Composition of Playroom Space: As shown in Figure 1, a type of two-level 'stage' was arranged in the center of the playroom, to make structurization easier. This part of the playroom is called the "Communicative Space" (CS). This CS is a relatively quiet area, and the amount of contact within a short distance is quite high. In general, it is hypothesized that the CS has a strong tendency to promote remarkable growth of personal relationships. Conversely, since a "Round Space" (RS) around the CS is rather large, it is a relatively dynamic space. Thus, children's activity spreads out, giving therapists many opportunities to contact children through toys. RS and CS serve to complement each other. According to a behavioral space therapy guidance hypothesis, CS enhances and strengthens characteristics as a figure, while RS has a tendency to enhance characteristics as a ground.

(2) Choice of Toys: From an assortment various toys, specific items are chosen, such as those which easily induce children's connective actions, and bring about common actions among the entire group. In therapy, very large blocks, which are possible to interconnect and move about by attaching pulleys, have been used so far.

(3) Psycological Composition of Playroom Space: With background music a guide flow is devised such that children can be aware of and prepare for the next activity. Moreover, a chief therapist mainly has preeminence over the other therapists and serves as a focal point of the CS. It is sought to direct the flow of children's 'associated' behavior so as to cohere and condense the behavioral space.

These three items form the basic framework of behavioral space therapy. An analysis method suitable for evaluating results of clinical activities which utilize this therapy has been developed (Gotoh, Ogasawara, Gotoh, & Fukuhara, 1991). The accuracy of this analysis method was improved by using the "Quotient of 'Associated' Behavior" (Kanazawa, 1991, Gotoh, Ogasawara, & Kanazawa, 1992).

Several findings have been made in behavioral space therapy research. The studies are all oriented towards handicapped children, and are investigated in view of three constituents-"personal relationships", "object relationships", and "common use of behavioral space" for associated aspects of behavior in social space (Gotoh, & Ogasawara, 1989, Ogasawara, & Gotoh, 1989, Kanazawa, 1994). Particularly, Kanazawa focused on physical environment in the playroom space and analyzed group 'associated' behavior. She subsequently made it clear that formation of the physical space (the existance of CS constituent) influenced an increase in group 'associated' behavior. In research so far, however, sufficient actual investigation has not been carried out concerning functional characteristics of therapists who have a close relationship with these children's 'associated' behavior. The research dose not clarify the relationship between differneces in arrangement of the physical environment and children's 'associated' behavior.

Thus, in this research while we clarify characteristics of children's 'associated' behavior depending on differences in make up of their therapists team, we investigate functions of those therapist's groups. Here two groups are formed. One is a team which consists of two students learning the Behavioral Space Therapy along with their guidance instructor (this is termed the "therapist team" below). The other team cosists of three mothers of their object children (the "mother team"). In this research

our aim is to clarify characteristic differnces in children's 'associated' behavior in an instructional situation by these teams, with comparison and analysis by the quotient of 'associated' behavior.

Methodology

1. Formation of Analytical Object Group and Space Setup

A summary profile of the instructional object children is given in Table 1. In this research, the six children shown in Table 1 were the object of scheduled experimental group therapy. These children all belong to the same special class, so a class member corresponds exactly to the instructional object group.

The chronological age shows the age at experimental time. The age distribution ranged from six years eight months up to eight years three months. The average age was seven years five months. Their IQ ranged from 42 to 74, with an average of 55.8. The Suzuki-Binet Test was used for IQ measurement.

On the other hand, the instructional teams consisted of a therapist team, made up of an instructor who is in charge of this therapy method, and two students who were continually studying the therapy method, and a mother team, made up of three mothers whose children were instructional objects. One of the mothers took the role of a team leader. Consequently, each group consisted of nine members, including six instructional object children who were common to both groups.

The instructional space, shown in Figure 1, consisted of the CS; (Communicative Space) set up in the center of an 8m square playroom. The CS consisted of a square (244cm×244cm) 'stage' 25cm in height, and on top of that a 180cm diameter round 'stage' which was also 25cm in height. Toys were limited to only large size blocks which could be assembled and moved. For background music, the same music tapes were used for both groups from the beginning to the end.

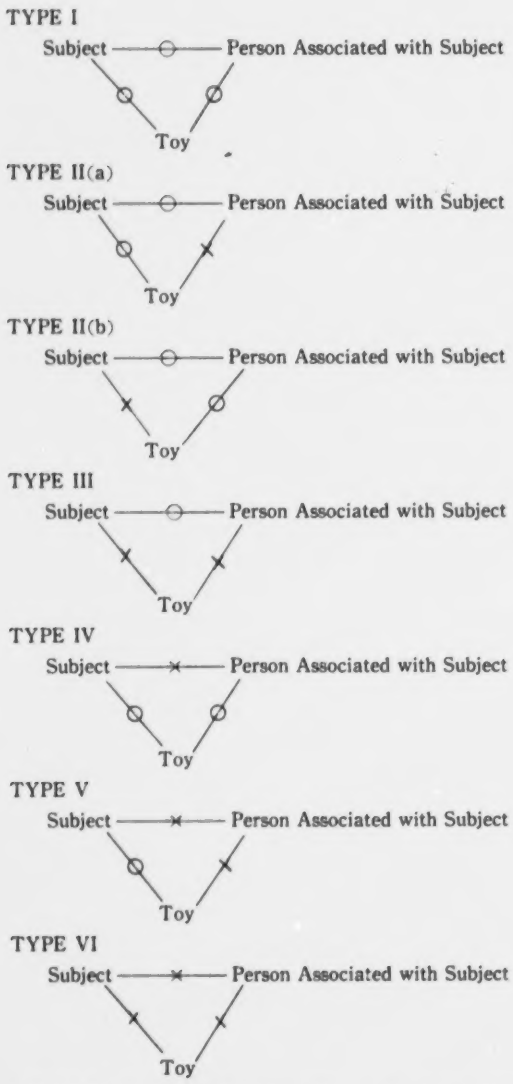
TABLE 1 Profile of Expermental Object Children

Object Children	Sex	Chronological age (CA)	Intelligent quotient (IQ)
Child A	F	6 : 10	74
Child B	F	6 : 8	47
Child C	F	6 : 9	53
Child D	M	8 : 3	51
Child E	M	8 : 3	68
Child F	M	7 : 10	42

2. Data Collection and Analysis

Instructional settings of both groups were recorded by a wide-angle camera attached at one corner of the playroom ceiling, as shown in Figure 1. The wide-angle camera was adjusted to permit the entire playroom to be viewed.

For analysis, instructional spaces (CS and RS) were obtained with the same physical composition setting for both groups and were recorded by a video recorder to



Note) Marks on the line connecting each category denote the following:
○ : indicates a relationship exists
× : indicates no relationship exists

FIGURE 2 Relation Category Diagram

be used as analytical material. Data were collected on September of 1993 for the mother team and on November 1993 for the therapist team.

In the first stage of analysis the basic data were generated using the analysis method (Behavioral Space Analysis) developed by Gotoh, *et al.* Based on this analysis method the degree of 'associated' behavior composition is determined from two parts, a personal relationship constituent and object relationship constituent. Figure 2

summarizes the relational category style, depending on the degree of the composition (Gotoh, Ogasawara, Gotoh, & Fukuhara, 1991, Ogasawara, 1993). For analysis, on the basis of data recorded by the video camera, the degree of 'associated' behavior composition was determined every five seconds, the analysis time unite. Analysis of the data included recording others with whom the subject associated. In deciding the relational category style, in the case which included a personal relationship, we decide to choose the category for which the composition degree was highest, connected within an analysis time unit between the specified others. Moreover, when we resolved the behavioral space within an analysis time unit, the category which placed highest was chosen as the formation space. Recall that the behavioral space is classified into the CS and RS as shown in Figure 1. This procedure was applied to each of the 9 members of both groups.

In the second stage of analysis, an 'associated' behavior quotient score was calculated for each date given above. The mathematical formula of the 'associated' behavior quotient is shown below (Kanazawa, 1991). This quotient was devised as an index to show the extent that three constituents—(1) Association with others, (2) Association with toys, (3) Sharing space with the team leader-were involved in the overall behavior of each member.

The 'Associated' Behavior Quotient is given by:

$$QI = \frac{Xi}{(N-1)V} \times \frac{Yi}{V} \times \frac{Ri+Ci}{V} \times 100$$

Where:

QI is Individual 'Associated' Behavior Quotient

Xi is the number of personal frames
(Categories TYPE I + TYPE II(a) + TYPE II(b) + TYPE III)

Yi is the number of object frames
(Categories TYPE I + TYPE II(a) + TYPE IV + TYPE V)

V is the number of analysis frames

N is the formation member number

Ri is the number of the frames of RS agreement with chief therapist

Ci is the number of the frames of CS agreement with chief therapist

This mathematical formula uses a ration to indicate the portion of the maximum possible value that could be obtained for each constituent within the analytical object film clips. Then by calculating the product of the three constituents, the formula gives the ration which represents the agglomerated 'associated' behavior. This quotient has characteristics that show how much the agglomerated 'associated' behavior (with a high degree of composition) is expressed in the behavioral space, shared with the team leader (the therapist in the equation), and expressed in the activity center. The maximum value of the quotient is 100 and the minimum value is 0, and it is assumed that the higher the member, the more the individual 'associated' behavior becomes highly affiliated social behavior. Other characteristics include;

As evident in the mathematical formula, if one of the three constituents is 0, for example there is no "object relation" constituent, then the resulting numerical value is 0 even though the other constituents may have a high value.

When the 'associated' behavior quotient is calculated, the behavior of mother A as a group leader, is determined as an index showing the degree of sharing of behavior space, in the same way as for the therapist team.

In analysis of recorded video data, the same analyst was in charge of the work since the analysis results of both groups are compared and investigated.

Results

1. Results of 'Associated' Behavior Quotient Based on Behavioral space

Table 2 shows the 'associated' behavior quotient results for the entire instructional space, and the 'associated' behavior quotient calculated depending on the behavioral space in which the chief therapist and Mother A (who supposedly constitute the core of group activity) are located. Here, for the entire instructional space of both teams, the portion of behavioral space occupied by the chief therapist and Mother A are expressed as a reference for analysis. The quotients are broken down into two categories-for activities in the RS and another for those in the CS. Then the 'associated' behavior quotient of each constituent member was calculated. The chief therapist

TABLE 2 'Associated' Behavioral Quotient for the Entire Instructional Space and Depending on the Behavioral Space

	Therapist Team				Mother Team			
Category of Frames	Overall 461	The RS Activity 131	The CS Activity 330	*Difference	Overall 454	The RS Activity 363	The CS Activity 91	*Difference
Chief Therapist								
Therapist A	7.67	5.58	7.99	+2.41				
Therapist B	3.38	5.02	2.30	−2.72				
Mother A								
Mother B					10.30	11.08	0.68	−10.40
Mother C					6.23	7.48	0	−7.48
Child A	5.31	3.23	5.90	+2.67	5.57	6.04	0	−6.04
Child B	1.81	2.80	0.79	−2.01	6.27	7.29	0	−7.29
Child C	4.18	1.18	5.79	+4.61	4.30	5.08	0	−5.08
Child D	4.67	2.76	5.38	+2.62	6.78	9.73	0.39	−9.34
Child E	5.96	4.38	6.50	+2.12	5.09	4.76	6.55	+1.79
Child F	3.91	0.73	6.04	+5.31	7.25	6.45	10.74	+4.29

* Difference = The CS Activity − The RS Activity

assumes a role as a giver of direction and flow to the entire group's activity, and the quotient of the chief therapist herself is not calculated for the same reason.

For the entire instructional setting, 461 analysis object film clips were obtained for the therapist team and 454 clips for the mother team. From these totals, the analysis revealed that the therapist team activity comprised 131 clips in the RS and 330 clips in the CS. On the other hand, for the mother team, RS activity amounted to 363 units and CS activity was 91 units. The RS activity, which resulted in 461 analysis object pieces for the therapist team, accounts for 28.4% and CS activity accounts for 71.6%, while RS activity of the mother team, which totaled 454 units, accounts for 80.0% and CS activity accounts for 20.0%. Thus there is a notable differnce between the therapist and mother teams.

Looking at the quotient for the entire instructional space, therapist A scorers 7. 67, the maximum value among the 8-member therapist teams, and Child B had the minimum value of 1.81. In the mothers team on the other hand, Mother B as a instructor obtained 10.30, the maximum value, and the minimum value was 4.30 for Child C. Therefore, by comparison of the quotient for constituent members of each team, a common tendency for both teams is that the maximum value is held by the instructor. Next, when the quotient is compared for the six children depending on the team (therapist or mothers), there is a common tendency. That is, there is a tendency that the quotient for five children (i. e. excluding Child E), to be higher in the mother team than in the therapist team. This results from the difference that the instructional space for both teams reflects on the children's quotient.

Next, when one subtracts the quotient obtained in RS activity from the quotient obtained in CS activity and looks at the general tendencies about the difference between the two, it is seen that there are six members our of eight in the therapist team for which the difference is positive. From this analysis result, it is concluded that on the whole there is a tendency that for the therapist team, the quotient was higher in CS activity than RS activity. In contrast, the mother team showed an opposite tendency to this and for six out of eight members the difference resulted in negative values. In the mothers team, the quotient for CS activity of six members out of eight are all less than 1.0, so the values are fairly low.

Summarizing the above results, in the entire instructing spaces there is a tendency for the mother team quotient to be higher than that of the therapist team. In the mother team the quotient obtained from RS activity is higher than that from CS activity, while in the therapist team the quotient obtained from CS activity is higher.

Looking next at individual differences among the children, three children—A, C and D—reflect the same tendency mentioned above for the teams; in the therapist team they show a positive difference, while in the mother team they show a negative difference. On the contrary, Child B shows a negative difference in both teams and Child E and F show a positive difference in both teams. these three children display a consistent tendency in their individual activity. In Child B, however, a difference of -2. 01 in the therapist team grows to -7.29 in the mothers team. Therefore, it is understood that the ration originating from RS activity is large in the mothers team compared to the therapist team. Moreover, Child E shows a difference of +2.12 and Child F

shows a difference of +5.31 in the therapist team, while in the mothers team Child E shows a relatively small difference of +1.79 and Child F +4.29. This result indicates that the quotient in RS activity is larger in the mother team.

Incidentally, in this research analysis a total of four zero values are obtained. These zeros all originate from CS activity with the mother team. The 'associated' behavior quotient is calculated by multiplication of three constituent ratios, "Association with Others," "Association with Toys," and "Shared Space With Team Leader." Therefore, it is necessary that one of constituents has a zero value in order to obtain the minimum value of zero. When we analyzed the film clips to find the particular costituent which had a zero value, "Shared Space With Team Leader" was zero for Child A, B, C and Mother C. As a result, the theoretical minimum value of 0.0 is actually obtained.

2. Results of 'Associated' Behavior Quotient Calculated at Different Times

Table 3 shows the 'associated' behavior quotient calculated after separating the whole instructional space into two parts based on time. For the therapist team 230 frames were obtained in the first half, and 231 frames in the latter half, while for the

TABLE 3 'Associated' Behavioral Quotient Calculated at Different Times

	Therapist Team			Mother Team		
Category of Frames	First Half 230	Second Half 231	** Difference	First Half 227	Second Half 227	** Difference
Chief Therapist						
Therapist A	5.62	10.23	+4.61			
Therapist B	2.86	3.42	+0.56			
Mother A						
Mother B				12.76	7.09	−5.67
Mother C				7.04	4.17	−2.87
Child A	7.90	2.72	−5.18	4.97	6.06	+1.09
Child B	2.74	0.84	−1.90	9.19	3.47	−5.72
Child C	3.15	4.74	+1.59	4.69	2.95	−1.74
Child D	3.40	6.08	+2.68	12.55	2.94	−9.61
Child E	4.55	6.68	+2.13	5.48	3.99	−1.49
Child F	2.35	5.42	+3.08	8.87	5.59	−3.28

** Difference = Second Half − First Half

mothers team 227 analysis object frames were obtained in both the first and latter parts.

Firstly, let's take a look at team tendencies by examining the quotient for the therapist team for different intervales of time. The time differnce mentioned herein refers to the differnce in the value of the quotient going this differnce in quotients going from the first part to the latter part (Second Part—First Part). The third column under "Therapist Team" shows this difference in quotients going from the first half of therapy to the latter half. It can be seen that Child A and B have a negative value. However, the change for the other four children is positive, which means a tendency exists for the latter half to be higher than the first half. Furthermore, the quotient for Therapist A and B also increase from the first half to the latter half. From these analysis results, it is concluded that the 'associated' behavior quotient becomes higher in the latter half of therapy than in the first half.

On the other hand, the mother team shows an opposite tendency to the therapist team. As shown in the column on the far right, the difference quotient for each constituent member, except Child A, is negative. From the facts above, we can say that in the mothers team there is a tendency for the 'associated' behavior quotient to decrease in the latter part of therapy compared to first part.

Comparing trends in the quotient for each child in the therapist team with the corresponding quotient in the mothers team, four children, C, D, E and F reflect the same tendency mentioned above for the teams. Specifically, for these four children the quotient in the therapist team shows a rising tendency ; that is, it is higher in the second half than in the first half. At the same time the quotient in the mother team shows a declining tendency; that is, it is lower in the second half than in the first half. On the contrary, Child A shows an opposite tendency, that is, the quotient declines in the therapist team and rises in the mother team. Moreover, the quotient for Child B shows a declining tendency both in the therapist and in the mothers team, the only instance for which a consistent tendency is exhibited for an individual subject. However, the quotient difference for Child B was -1.90 in the therapist team, but increased to -5.72 in the mother team. This child's declining tendency is strengthened in the mother team, which corresponds with the declining tendency of the quotient which is common to the mother team as a whole.

Discussion

In this research it was our aim to clarify functional characteristics of instructor groups based on Behavioral Space Therapy utilizing an analysis of children's 'associated' behavior in an instructional settings of two different instructor teams. In this discussion, further investigation of these analytical results will be made, along with additional considerations of the object children's 'associated' behavior in the therapist team and mother team instructional settings. We will also investigate functional charcteristics of the instructor groups using Behavioral Space Therapy.

The 'associated' behavior quotient is calculated as basic data from the results obtained by behavioral space analysis. It is a numerical value obtained by multiplication of three constituent ratios, (1) Association with Others, (2) Association with

Toys, and (3) Shared Space with Team Leader. Therefore, if the numerical value of the 'associated' behavior quotient for a subject is high, it means that a relatively high degree of 'associated' behavior with others involving toys is exhibited. In addition, it is a premise that 'associated' behavior involving the chief therapist, who leads the whole group, is formed in a context in which the chief therapist's behavioral space is shared.

First, we will consider the characteristics of the 'associated' behavior quotient for the entire instructional setting. From this analytical result, it is clear that for the approximately 38 minitues of recorded instructional setting, the quotient of each constituent member with the therapist team tended to be lower than with the mother team. This outcomes for the entire instructional setting shows that the strength of 'associated' behavior under the instructional setting of the mother team was higher than that by the therapist team. Moreover, comparing the quotient for both instructor teams and children, the instructor teams' quotient tended to be higher than the children's quotient. It is pointed out that therapists had a major role in forming children's 'associated' behavior. Regarding therapists' role in actually forming this behavior, the following two items should be considered: Association in which therapists directly appeal to work with children and try to interact with them, and another type of association in which therapists indirectly try to associate with children through toys. In research of Gotoh, Ogasawara, Gotoh and Fukuhara (1984), it was made clear that in the behavioral space therapy instructional setting, the previously mentioned 'association with toys' by the therapists is more remarkable. Judging from these aspects, there is a common result since instructors of both teams carried out functions to support children's 'associated' behavior formation. There was a difference, however, in the specific method.

As previously mentioned, the 'associated' behavior relationship of each constituent member in the overall instructional setting was higher in the mother team than in the therapist team. However, when one examines it again from the "Physical Composition of the Playroom" standpoint, as one of the Behavioral Space Therapy constituents, the situation is different. An earlier section described the "Physical Composition of the Playroom" in Behavioral Space Therapy, and the schematic was shown in Fig. 1. Basically, it consists of the CS containing a square 'stage' and on top of that a circular 'stage', surrounded by the RS. In turned out from the analysis that in the therapist team the quotient for CS activity was higher than for RS activity, and conversely, in the mothers team it was lower for CS activity than for RS activity.

In this way, the instructional setting of the therapist team is characterized by a higher 'associated' behavioral relationship in CS activity (located in the center of the playroom), and this relationship is lower in RS activity (which surrounds CS). Therefore, with the therapist team it is considered that the therapists strengthened the supportive functions of children's 'associated' behavior in the CS, which is a smaller space than the much wider RS space. In Behavioral Space Therapy the CS is considered as a type of "gathering place" for the entire group (Gotoh, 1993). A constituent of therapy is pointed out, namely, that while the chief therapist maintains contact with other therapists, she makes use of toys to indirectly influence each child's spontaneous action towards a certain direction, and creates a space in which the flow of the whole

group's activities is contained (Gotoh, Ogasawara, Gotoh, & Fukuhara, 1991). Thus, in Behavioral Space Therapy, the way CS, the "gathering place" is utilized by therapists in connection with the RS (which surrounds CS) as an overall group activity space involves the meaning of the therapy contents. The analytical results obtained in this research for the therapist team tells us that the rationale or philosophy in administration of these Behavioral Space Therapies was spacifically expressed in the instructional setting.

Characteristics of these Behavioral Space Therapies are further clarified by investigating the instructional setting of the mother team. In the mother team the 'associated' behavior relationship in the RS was higer than that of the CS activity, and in the behavioral space RS is more heavily weighted. Moreover, it may be pointed out that there were six constituent members whose quotient was zero, or nearly zero, in the CS. Namely, it is assumed that in the mother team CS did not function as a group "gathering place", but rather the RS was more meaningful for composition of 'associated' behavior.

Characteristic differences of both teams were also exposed in the results of the 'associated' behavior quotient when the full therapy was broken into the two parts. Mention was made about the tendency with the mothers team for the 'associated' behavior quotient to decline from the first half of therapy to the latter half, while with the therapist team it rose. As for these tendencies, we can say it may be necessary to divide the therapy into not only two parts (a first half and latter half), but rather three parts (a first, middle and final unite) and then calculate the respective quotients and compare and analyze the trends. However, the increase in 'associated' behavior from the first half to the latter half with therapist team is assumed that the 'associated' behavior of each constituent member at the beginning of therapy becomes a reference point, which was condensed as a whole group activity as time passes. In addition, when we consider that the relationship of the 'associated' behavior of the therapist team is higher for CS activity, compared to RS activity, the CS is considered to be a group activity space, and there 'associated' behavior having a more advanced relationship was formed. Furthermore, an increase in 'associated' behavior for the group in the latter part of therapy is assumed to be connected with the object children's aptness for a new space which will probably be constructed by the next therapy.

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LET YOUR TODDLER JOURNEY TO SEPARATION: CHILD SEPARATION AND RECONSTRUCTION OF PLAYFUL INTERACTIONS IN THE JAPANESE MOTHER AND CHILD

Shigeru Nakano
Fuji Women's College

Abstract

This article discusses theoretically and empirically, how child separation during toddlerhood in the Japanese society is culture-bound and how it leads to a reorganization of maternal interactions, including their playful teasing. Characteristic features of maternal playful teasing in their interaction are considered as a seeking for the mutual feelings of unitedness and the concept of incident-affinity was proposed. Developmental semiotics of toddlers' separation from the mother in Japanese culture was discussed from the view of *amae*. In the discussion, problematic points in traditional cross-cultural studies are considered and, a theoretical viewpoint to overcome them is proposed.

Keywords: child separation, maternal playful teasing, incident-affinity, Japanese culture

1. INTRODUCTION

It has been demonstrated that mothers often employ tickling with exaggerated actions, light threats, or expressions of mild surprise to evoke emotion, especially laughter in children, and attempt to share playfulness with the children (Trevarthen, 1984, 1990, 1993). Employment of such actions by mothers was observed in every-day mother-infant interactions from as early as the first half of infancy. For example, Trevarthen (1979) reported that a mother showed such teasing with her 11-week-old son. This pattern of maternal joking behaviour that mothers make out of the feelings or interests of their babies has been called "maternal playful teasing" (Nakano & Kanaya, 1993; Nakano, 1994a; Trevarthen, 1984, 1990, 1993).

A typical pattern of the teasing is shown in the way that a mother holds things out towards her baby, shakes them to attract his/her attention and takes them back again with exaggerated facial expressions or physical gestures and/or intonational vocalizations (Gregory, Hartley, & Newson, 1994). It is different from the counterpart, *malicious teasing* that is intended to hurt and make the teased suffer, as Nakano (1994a) distinguished. Oppositely, maternal playful teasing to their children can be characterized as *benign teasing* because mothers must employ it expecting not only to give enjoyment to their children, but also to share in the pleasure with them. Thus, proccesses of playful teasing can be considered as a *negotiatory processes* for attaining

"mutual feelings of unitedness" in pleasure between mothers and their children.

The negotiatory processes would be inevitably reorganized in culture-reflecting turning points of child development such as child separation from mother described below, because maternal caregiving and interaction styles are assumed as actualization of cultural communication styles within mothers' intersubjective experiences (Stern, 1985) in their daily lives in their culture. Attainment of a mutually seeking of "feelings of unitedness" or intersubjective satisfaction becomes articulated between mothers and their children within a culturally shared frame (Fogel, 1993). Thus, Culturally appropriate development is embodied through a process of interactions toward a mutual feeling of unitedness within a frame which culture offers as a proper way of communication.

Japanese mothers of toddlers seem abruptly to become having a strong expectation for child separation, which is in contrast to the way they allow their children to seek proximity to them in infancy. The successful developmental change in mother-child relationship from proximity seeking to outgoing can be seen as crucial in the processes of child development as 'turning point' in Japanese mother-child relationships. Furthermore, it is more significant than the formation of the mother-child attachment relationship in the second year of life, according to Nakano (1990).

It is hypothesized that Japanese children's successful separation from their mothers in toddlerhood reorganizes their mutual interactions, including playful teasing, into more satisfactory ones than their interactions in the period when children are unwilling to separate from the mother. In following pages, I will discuss characteristic features and psychological significances of maternal playful teasing first, and the developmental semiotics of toddlers' separation from the mother in Japanese culture, second. Then, I will describe an experimental observation of the influences of toddlers' separation on maternal playful teasing interactions. Finally, some proposals to study of cultural aspects of child development will be presented as implications from those discussions.

2. WHAT IS MATERNAL PLAYFUL TEASTING, AND WHAT ARE ITS PSYCHOLOGICAL FUNCTIONS?

(1). Characteristics of Playful Teasing

Teasing, whether benign or malicious, is a person-to-person activity unexceptionally. In order for an act to be teasing the teaser has to guess correctly by which conducts he/she can arouse positive/negative emotional reactions of the person to be teased. To succeed the attempt, the teaser has to know the behaviour patterns and inner state of the teased. The characteristics of teasing, both with benign intentions/motives and with malicious ones can be described as they occur in close, intimate relationships. In other words, teasing reflects the intimacy between a teaser and the teased that may be called a *joking relationship* (Pawluk, 1989), in which they enjoy jokes in the form of teasing, banter, and mutual flirtation. For example, Dunn (1988) reported that a one-and-half-year-old second-child broke her older sister's valued possessions, or put a spider on the desk, when she had had a fight with the older one.

The most typical instances of playful teasing by mothers take the following pat-

tern (Gregory, Hartley, & Newson, 1994);

a). Mother offers her baby a rattle, jiggling it in her hand to impart to it noise and movement.

b). Baby attends to the rattle and reaches for it with the right hand.

c). At the precise moment that the baby is focused and about to make manual contact, mother moves the rattle back several inches beyond the baby's reach and says 'Do you want it then?'

d). Baby reaches more determinedly with increased visual attention and makes effortful vocalizations.

e). Mother moves rattle back to place it, handle first, into the baby's outstretched hand saying 'Here you are then.'

Although there is not a proper term to describe playful teasing in Japanese language, only the word KARAKAI (noun) or KARAKAU (verb) to describe malicious teasing, my preliminary observation of mother-child free interaction at home found the following sophisticated pattern of it using 'deception':

a). A mother of a 10-month-old baby clapped her hands gently, rhythmically and repeatedly just in front of the baby to catch his interest in her actions.

b). At the time when the baby looked at her performance surely enough, "My hands are stuck to each other. I can't separate them!", the mother suddenly shrieked with exaggerated tone and pretended to pull her hands apart with all her strength, showing her "stuck hands" to the baby.

c). The mother begged the baby's help with affected intonations, "What can I do? Please help and pull my hands apart!"

d). At the moment when the baby was persuaded and attempted to pull her hands apart, the mother abruptly separated her hands in a manner startling to her baby and said "Bang!" at the same time.

e). As soon as the baby was surprised and stared at her face, the mother expressed a big smile and laughed joyously to the baby.

f). The baby started to smile joyfully too.

As these instances suggest, the mothers' teasing acts consisted of rapidly transforming contradictory alternations; from their irritation to the child in the first stage of their actions, to quick expression of clear smiles and laughter to wipe out any aroused irritabitity in the child and to give enjoyment. Not only the mother making an intuitive consideration of how their motives in teasing are acceptable to her to-be-teased child but also the child's perception of the mother's play motive are necessary for playful teasing to be playful, and different from malicious teasing. Then, in a process of playful teasing, if the mother's playful motives are not transmitted to her child, or conversely, if a child does not sympathize with them, even the benign teasing would be taken negatively and may lead to distress in the child as Nakano (1994a) categorized; *malign teasing* which is the teasing *eventually perceived to be malignant*. The mother's success or failure in communicating her playfulness, or in seeking mutual pleasure depends on whether or not the child can engage in *metacommunication* (Bateson, 1956) with the mother, i.e. whether the child is reading the subtle message as more significant than the mother's apparent actions themselves (Nakano, 1994a). Thus, it is

a general characteristic of playful teasing that the stucture underlying it comprises a fickle and fluctuating bi-directional process between the positive and the negative, regulated within the intersubjective relationship (Trevarthen & Hubley, 1978) or emotional attunement (Stern, 1985) or 'intersubjective theory of others mind.'

(2). Function of Playful Teasing

As Nakano (1994a) and Reddy (1991, 1994) pointed out, in spite of the theoretical and observational evidences of its importance as described above, remarkably little notice has been paid to playful teasing by psychologists. One reason may be that they are swayed to a onesided view of the harmful or abusive images of teasing connected to bullying. For example, Harris (1989) described teasing only as hurting others, i.e. malicious teasing.

To challenge this oversight, we must answer the basic question of maternal playful teasing, "Why are mothers tempted to tease their babies?" Gregory *et al.* (1994) viewed maternal playful teasing as "paradigmatic examples of situations, which although predicated on these mutual understandings, go beyond them, by introducing apparent incongruities between the overt verbal or gestural message and the context which comprise the semantic domain (p. 1)." They explained that mothers engage in tantalizing their infants because they want to ensure the infants' responses to them are "more than an automatic reach-to-grasp-on-sight reactions" and to show that he/she is the person with whom the mother negotiates, by means of encouraging the infant to show deliberate reaching with more intentional "I-want-that" gestures. In short, in the negotiatory process of their teasing, mothers would be doing an experiment, probing whether children's reactions to their attempts are deliberate, as well as guiding them to willing offers. This interpretation seems to present a convincing explanation why mothers attempt to tease their children from earlier infancy.

Some of the social anthropological studies on maternal non-playful teasing also offer a similar interpretation based on the "maternal-teasing-as-teaching" view. Bateson (1949) reported a characteristic pattern of mother-child interaction in Bali that Balinese mothers often seduced and teased playfully their children to arouse excitement of (sexual) emotion repeatedly, then evaded the child's passion when he turned it toward her seriously. It was argued that such a mother-child interaction would provide the context for Balinese children to learn to control their emotional passion. Benedict (1946) described "babyhood teasing" as a common socialization technique peculiar to Japanese mothers. This is when a mother holds and swings her child acting as if she takes care of "a realbaby" and saying "My big baby, how cute you are" with exaggerated intonation to shame him/her, when the child wants to sit on her lap persistently, though grown up enough to be separate from her. Benedict speculated that such a controlling technique would foster sensitivity to feelings of shame in a social situation, which has been portrayed as one of the central characteristics of the Japanese. Clancy (1986) observed that Japanese parents have often used this strategy to discipline their children to be compliant with them. Actually, if a young Japanese child insists obstinately not to stop playing with a toy and resists a request of the mother to come home, the mother is likely to say to the child, "Bye-bye, you can stay

alone and keep playing here", and pretend to leave for the house. These maternal teasing strategies can be interpreted as Japanese mothers are likely to teach their children social discipline by means of making him/her aware of the rediculousness of his/her conducts.

As an explanation from another viewpoint, Reddy (1994a) suggested that "teasing acts to promote interpersonal contact at a personal level" and "can help to increase familiarity with negative emotions and the individual's ability to cope with them." Dunn (1988), who studied 'child teasing' to hurt siblings and parents, also articulated an insightful argument that researchers who focused on socialization by disciplinary action have dismissed evidence of the pleasure and excitement that children experience in transgressing rules, and in confronting and teasing others. She explained that children's teasing exchanges with them have the potential for helping the child to learn the limitations of acceptability of emotional expression in keeping with a good relationship.

(3). Incident-Affinity and Mutual Feelings of United Pleasure

Those explanations of the function of teasing seem correctly to account for some aspects of teasing. And as Reddy (1994a) claimed, the boundary of benign and malicious teasing may not "inviolable", but be negotiated and "fluctuating" in interaction. However, playful teasing is considered to include another characteristic; directed to mutual enjoyment. If a teasing attempt of a mother led to serious distress in her child, the attempt would be aborted or replaced by another one. In the negotiatory process in teasing interaction, mothers may act for children to find amusement from them, as well as their own enjoyment. In a sense, it can be hypothesized as a negotiatory process toward *attaining mutual feelings of united pleasure* or *enjoyment* sharing between mothers and their children. Similar ideas have been proposed by Stern (1985) and Trevarthen (1992). But, why are mothers so tempted to tease their children and why do children enjoy the attempts of the mother?

Nakano (1994a) introduced the concept of *incident-affinity* to answer ths question. Incident-affinity is an ability to make sense of a perceived incident by bringing into and linking it with the history of the intersubjective relationship and to share it as a meaningful and controllable topic (anecdote) in the interaction with their *companion* (Trevarthen, 1994). Two types of incidents are assumed; environmental and deliberate. Environmental incidents are defined as something noteworthy happening including notable dissimilarity from daily-routines or ordinary events caused by either some physical accidents (e.g. car-crashes, stumbling over a stone) or natural phenomena (e.g. flurry of snow, rainbow), or attempts or expressions in the process of person-to-person interaction (e.g. unexpected reactions, showing a passion). For those happenings to be recognized as incidents, they should be *noticed and perceived* regardless of their magnitude. For example, even though a clear beautiful rainbow has appeared, as far as we do not notice and perceive it, we cannot recognize it as incident. Conversely, we can find a very subtle difference in the manner of a close friend from his/her ordinary attitude to be a significant incident (e.g. an unusual tone of voice).

Sometimes, a mother will deliberately attempt to create an artificial incidents for their children who were assumed to be interested in the attempts and to play as cooper-

ators. They seem to rather like to produce such exploits to create interaction with their children and to perturb its accustom pattern. Indeed, we do not always repeat established routinized interactions with others as predictable patterns or scripts, but are willing to go beyond them in an attempt to create a new format or new levels of intimacy acceptable to both interactants (Patterson, 1985). If a mother is willing to engage in new attempts to create incidents and to expect to attain mutual feelings of united pleasure with the companion in an interaction process, it is necessary for her to read or sympathize with the inner state or disposition of her child. The same thing is also required of the child as a companion in the negotiatory process. Thus, mutual trust within intersubjectivity (Trevarthen & Hubley, 1978) is needed for incident-affinity to be shared between them. However, the receiver's reactions to the attempts are considered to be both predictable and unpredictable to the performer at the same time, i.e. *stochastic* (Bateson, 1972). Thus, though results of her attempts can be expectable, actually it is incidental even for herself. However, we could speculate that the ratio of successful attempts, i.e. elicitation of child laughter as expected, would be greater than unsuccessful ones. It can be postulated that both the mother and her child have to have incident-affinity. To attain mutual feelings of united pleasure with her child, the mother attimpts to deliberately create incongruities or discrepancies from the stable or ready-made way of interaction in the context and engages in negotiation with the child (Trevarthen, 1992, 1993). This may be termed a *gap-opening-and-closing process*, an idea derived from Lave's (1988) dialectic discussion about everyday practice. Stern (1985) also remarked that "it lay in the discrepancy between the way gradient features were actually performed and the way they were expected to be performed, given the context. The work of interpretation thus consists of measuring the distance between an imaginary performance and an actual performance of gradient features (pp. 179-180)."

The notion proposed here is against the notion of linear-causality between a mother's action and the reaction from her infant, as was underlying the notion of maternal sensitivity (Ainsworth, *et al.* 1978). On the contrary, as Fogel *et al.* (1992) suggested, "emotion is the process that emerges from the dynamic interaction among these components as they occur in relation to changes in the social and physical context" (p. 129) from the viewpoint of social process theory, the incident which comes from her attempt may evoke laughter from her child, or it may lead to distress. Perhaps at a certainpoint, the attainment to mutual feeling of united pleasure suddenly break up and a new organization of the interaction pattern by mutual appraisal of the attempt appears as a result. Laughter of both the mother and her child will be elicited depending on the appraisal because it nearly always occurs as a response behavior (Nwokah, Hsu, & Fogel, 1994). Games and jokes including playful teasing are seen as good examples to be filled with deliberate incidents. The fact that they amuse by perturbing our expectations depicts exactly the function of incident-affinity.

Fogel *et al.* (1992) pointed out that the systematic relationship between emotion and the infant's ongoing actions has not been fully grasped because researchers have studied emotion in highly intense or traumatic situations. The viewpoint of the function of maternal playful teasing proposed above may provide a possibility for further

studies on intersubjective relationship and continuous dynamic changes in occurrence of laughter.

(4). Developmental Reconstruction of M-C Interaction

In spite of the evident theoretical importance of playful teasing, it has been disregarded by researchers, (Nakano & Kanaya, 1993; Nakano, 1994a; Reddy, 1991, 1994), probably due to its harmful or abusive images led by superficial views, as well as prejudice which regards as 'bad' play which comes from the rational idealism of child play (Sutton-Smith & Kelly-Byrne, 1984). Maternal playful teasing seeks mutual enjoyment with her child and her attempts are aimed to draw out the child's laughter, as described above. Nwokah *et al.* (1994) indicated critically that specific attention to infant laughter in mother-infant interaction has been limited because, possibly, in laboratory settings laughter seldom occurs since laughter is expressed in only a familiar, relaxed situation. By this neglect of both maternal playful teasing and laughter, studies of not only positive emotion but also intersubjective relation in dynamic flows of mother-infant interaction, i.e. the picture of the child's *vital* development in everyday situations, seems to have been hazarded to be skewed off for rather pathological views from, for example, *secure* attachment. As a result, there are very limited numbers of developmental studies of teasing or joking, or of laughter in mother-child interactions through infancy and early childhood. Nwokoh *et al.* examined timing and temporal sequence patterns of laughter of both mothers and infants by a longitudinal observation over the first 2 years. The results showed that timing features of infant laughter appeared to have stabilized and overlapped with the mother's laughter by the second year, as well as increasing in non-dyadic, self-repetitive laughter, contrasting with the relative stability in maternal parameters over time. In short, in the second year infant laughter is not only more sensitive to mother's laughter and attuned to it, but also it is idiosyncratic. They explained the increase in non-dyadic laughter in the second year by the fact that at that time mothers frequently portrayed non-positive affect during infant laughter, i.e. by the contrary laughter situation which occurred in situations when the mother expressed a pretended emotion or when she chased her infant, or when infants began to tease their mother, or the child engaged in mastering a new skill.

Although Nwokah *et al.* demonstrated those dynamic aspects in the developmental processes of infant laughter and mother-infant interaction from the viewpoint of a dynamic systems approach, the intersubjective quality of the mother-infant relationship seems to have slipped off from their analysis of temporal patterns of laughter and then explanation of the results, as Bloom (1992) criticized the dynamic systems perspective proposed by Fogel *et al.* (1992) that it is more descriptive than explanatory. In contrast, Nakano (1994a) observed maternal playful teasing and children's reaction to it in an experimental dyad play situation with toys that would lead a mother to playfully tease her child. The results demonstrated the frequency of children's playful responses including smiles or laughter, or pretending over age of 11, 18, 28, and 38 months, and depicted a U-shape curve with those in 18-month-old children significantly lower than those in younger or older groups. Eighteen-month-olds were highly attentive and hardly showed enjoyment to their mothers' teasing attempts. Nakano inter-

preted the result in 18-month-olds as reflecting the infant's ongoing developmental gradient to reconstruct a new intersubjective relationship from a stable relationship in 11-month-olds with 'affect attunement' (Stern, 1985) to one with symbolic abilities, which has just emerged by the age, to be capable of finding meaningful cues in the mothers' teasing actions. The recovery of children's playful responses to their mothers' attempts after 18 months appear to support this interpretation. In other words, it shows developmental changes in the expansion of comprehension of metamessage created by mothers' teasing gestures from an immediate at-the-moment reaction.

Stern (1985) suggested that children who are beginning to be aware of language may have a problem in that they have been used to finding out and responding to gradient information, but when they want to label things verbally they have to categorize them, even though the most decisive information in everyday interpersonal communication may consist of gradient information. Trevarthen (1990, 1992, 1994) also discussed this 18-month-old difficulty from a similar viewpoint. He described the play at the age as 'egocentric' because children of this age are likely to reject any recommendation that their mothers offered as to what should be done with a toy. On the other hand, they are also strongly attentive to the mothers' mood or gradient information (Stern, 1985) known as social referencing (Klinnert, *et al.*, 1983). Trevarthen described that children of this age are willing to pick up what mothers show or say. The mothers continue to influence what they attend to and play with. This implies that toddlers do not simply resist the mother's controls, but that they still retain motive to maintain the frame of intersubjective relationship with their mother, somehow they know their mothers' expectation of what they should do in givien situations. This suggests that there may be some discrepancies in timing and sequences, as Nwokah *et al.* (1994) have presented, between proposals by the mothers and plans and self-appraisal for products of performances by their toddlers because of the limitation of their own contribution to the role in the situation.

On the other hand, as well as these discussions of the breaking-down in harmonious mother-child relationship at toddlerhood considered generally from developmental changes in the children, it ought to be considered that mothers' expectations for developmental changes in behaviour styles of their children who are departing from infancy may have a significant influence on the relationship. In Japan, the child's spontaneous separation from the mother at toddlerhood and the mothers' expectation of this seems to be crucial to understanding the conflicts in the relationship, as is discussed below.

3. CHILD SEPARATION FROM THE MOTHER WITHIN JAPANESE CULTURE

(1). From *Amae* and *Skinship* to Separation

Child's separation from the mother at toddlerhood seems to be a more crucial turning point on the developmental course in Japanese children than children in Western societies influenced by individualism. Doi (1977) from his wide experience as an expert of psychoanalysis theorized a concept of the Japanese term, *amae* as the basic desire to found interpersonal relationships, especially in mother-child relationships. Doi used 'dependence' as an English counterpart of *amae*, but he admitted that it has

its own sense indigenous to Japanese with no equivalent in English. *Amae* may be translated as "desire for indulgence" or "enjoyment of the feeling of being loved", which is born in the prelinguistic union with the primary "object-choice", the mother, who indulges the infant completely (p. 20). The desire indicates what an infant feels toward the mother when he/she wants to come close to her and is accepted by the mother. Thus *amae* means more than 'infant's dependence on the mother' which implicates a situation in which the infant is passively protected by the mother to be able to survive. It is true that indulgence and spoiling are poorly defined concepts, hard to identify and measure even within a culture (Tobin, 1992, p. 22). Those characteristics of *amae* may be close to the concept of 'intersubjectivity' proposed by Trevarthen and Hubley (1978), which depicts an innate ability in the child to recognize others, especially his/her mother as a human being the same as him/herself, and not only to expose an emotion toward the person, but also to deliberately, mutually adjust it to share experiences about events and things. This notion of intersubjectivity implies that infants have the basic trust which their motives are completely communicable to their mothers as well as *amae*. However, while intersubjectivity denotes a personal ability, *amae* describes the person-to-person relationship itself. In a situation of *amae*, a pair of the mother and her baby, a facilitator of dependence and a receiver of it, is completely interdependent; the mother *amayakasu* (indulges) her baby allowing him/her to act or express emotion even in a frivolous manner as he/she pleases, and her infant *amaeru* (enjoys being indulged) trust in the mother's benevolence and acting to express his/her will freely. Ito (1994) summarised the common characteristics in Japanese philosophers and their thoughts and listed the following three fundamental features. (a) *Non-substantiality or Process-oriented-ness*; which is that dynamic changes in a "flow" or process form the foundation of the world, where relation is preeminent over substance. (b) *Each-other-ness*; which indicates reciprocal relation in "Place". (c) *Self-becoming-ness*; which develops itself through autonomous self-organization of the relationship of each-other-ness. The concept of *amae* and *amae* relationship can be seen to reflect and articulate those features.

The *amae* relationship between the mother and her infant appears also a feature of the interaction called *Sukinshipu* (*Skinship*) in everyday life. The literal meaning of *Skinship*, which is a Japanese English word, is physical contacts or touching between a parent and the child including hugging, holding the baby in the mother's arms, carrying the child on her back and accepting for him/her to sit on her lap, but it also describes more metaphorically activities to express *physical and psychological* closeness between them, for example, co-sleeping, co-bathing and play with rough-and-tumbling. Markus and Kitayama (1991) noted it is typically true that there is much greater incidence of physical contact between mother and child in Japan and China than in most Western countries. Japanese families are likely to keep proximity and to often touch each other physically (e.g. Forgel *et al.*, 1992). The physical and psychological closeness, *Skinship* can be considered as reflecting Japanese mothers' stronger attribution of self to her infant. Bornstein (1989) summarised findings from Japan-America cross-cultural studies; the Japanese mother is likely to see her infant as an *extension of herself* and to organize her interactions so as to consolidate and strengthen a *mutual dependence*

between them, while American counterparts promote autonomy in her infants and organize her interactions so as to foster physical and verbal *independence* in the child (p. 173). Thus when a Japanese mother finds her grown-up child is sucking his finger, she may have a feeling of anxiety or to feel guilty that enough of her not supplying *Skinship* to the child might have caused the conduct.

The Japanese child spends infancy in a physically; psychologically very close relationship with his/her mother. Their separation from her, which means both mother and child deliberately take physically and psychologically disparate actions, may be rarely experienced. As discussed later, it can be concluded that Separation-Reunion between mother and child imposed in Strange Situation Procedure common in attachment researches (Ainsworth, *et al.*, 1978) is not a proper way to study Japanese mother-child relationship as some researches have pointed out (e. g., Miyake, 1990; Takahasi, 1986; van Ijzendoorn & Kroonenberg, 1988).

(2). Toddlerhood Separation between Japanese Mother and Child

Amae is not only found in mother-infant emotional relationship, but it is also used generally to describe intimacy in hierarchical relationships in social groups, as a Japanese idiom "peacefulness just like baby depends on (*amae*) the mother" represents. The feeling of *amae* toward the mother is not ended at infancy, but is maintained throughout life changing its anchor into a broader relationship in the social world. Further, it can continue in the form of *amayakasu* on the *maternal* side depending on the relationship with "the other."

However, it is fully conceivable that early mother-infant *amae* relationship is transforming into the next stage of separation in toddlerhood. Doi (1977) implied that the process is that the infant developing from initial unconscious acceptance of maternal indulgence (*amayakashi*) to awareness and demands of it when it is lacking, i. e. to *consciousness of separation* which means the beginning of awareness of *the self* (*jibun*). More correctly, the self can be considered to be simultaneous awareness or feelings of the self and of *the other's* feelings, as Reddy (1994b) discussed in another context. Awareness of the self depends on the awareness of the other.

In the same way, the awareness of the self and the other transforms to awareness of interrelationship with *others* in the next step. Doi (1986) postulated the duality of the self or two-tiered self of the Japanese which is differentiated by contexts; outer contexts (*soto*) where to be restrained in the exposure of *amae* feelings and to mask one's real feelings (*tatemae*), and inner contexts (*uchi*) where one is allowed to express real feelings (*hon-ne*) directly and freely. The most important point of this boundary is that the difference of inner or outer contexts is decided by *the other*, not by the difference of a public or private situation. Japanese may keep inner-context relationship with their friends outside of home, while they may express outer-context attitudes toward even the spouse when discussing more formal topics inside the home. There is no dichotomy between relationship and individual; freedom or restraint for the individual is found in relationship with the other who facilitate the conditions (Rosenberger, 1992). As described above, this *amae* notion assumes features of Japanese thoughts; Non-substantiality or Process-oriented-ness, Each-other-ness, and Self-

becoming-ness.

According to this theory, Japanese children must be socialized to be able to acknowledge such a psychological difference and to develop "theory of mind". They would learn this lesson from the latter half of the first year of life through interaction with the mother. For example, she shows the gesture of bowing to express "thanks" during give-and-take play with the child, or ask him/her to greet and bow before and after meals. In toddlerhood, they would learn the lesson of separation. As Tobin (1992) suggested, from the third year of life Japanese chidren would be focused on leaning how to constrain *amae* behaviour and to distinguish proper contexts for it, while for the first two years of life they are allowed to do things freely in an *amae* relationship.

Comparison between the Japanese and the American version of the Denver Screening Test for Child Development indicated that both Japanese and American mother's affirmative answers to the question whether their children spontaneously separate from them appear from the age of around two, but the percentage of the Japanese mothers' answer draws sharp increase and arrives at 100% at the age of around three, while the American one takes almost two years more to reach the completion (Nakano 1994b). In other words, there is a great homogeneity of subjective perception of the period of child separation among Japanese mothers, while there are larger diversity in the American counterpart. This finding implies that Japanese mothers in general would begin to expect their children' separation as soon as children have grown up to toddlers and it to be complete by the age of three. Such rapid and homogeneous achievement would not be done without mothers' storong, active involvement. It also suggests that the Japanese mother-child relationship may abruptly change from being psychologically and physically close, to being away from each other more. Actually, it is commonly observed in Japan that a mother takes her toddler to a play ground and ask the child to separate from her and play with peers there.

A longitudinal study of 20 children performed by Nakano (1990) also demonstrated the importance of child separetion in Japanese toddlers. It examined the correlation between the frequency of their spontaneous separation from the mother in free play in a laboratory situation at 3-and-half years, and their well-adaptability in kindergarten at 6 years, which was measured by scores of the Preschool Affect Questionnaire (Nakano, 1990) that consisted of 42 questions related to emotional adaptability in everyday situations in a kindergarten rated by school teachers on a 5-point rating. The results of the study demonstrated a significant relationship between them. Further, the study also showed that differences in attachment types measured in the Strange Situation Procedure at 12 months was not related to the difference in the adaptability at all. Contrastingly, many studies on Western samples concluded that individual difference in adaptability in socio-emotional activities, which originated from the difference in attachment types at one-year-old, would be tightly consistent at least through childhood (Sroufe, 1983). For examples, Arend, *et al.* (1979) and Sroufe (1983) evidenced that securely-attached children (B-type) at one year were more ego-resilient, curious and exploratory at preschool age, and they were more often inclined to start activities spontaneously than the insecurely-attached children (A & C-

type). However, it is assumed that attainment of smooth separation from mother in toddlerhood would be more significant for future socio-emotional development of Japanese children than their formation of secure attachment relationship with the mother at one year.

(3). Negotiation Toward Child Separation

This process of developmental change to attain child separation may include negotiatory interactions between mother and child as discussed in the section on playful teasing. For example, in an informal observation of maternal teasing in the home situation, a mother of a two-year-old boy pretended to cry and waited for the child to come over and show sympathy to her when he rejected the mother's order to clean up a room. Then the mother explained in exaggerated accents how his disobedience had disappointed her. As Lebra (1992) explained, the ideal character of the Japanese child is believed to be *suna-o* which means a well-balanced combination of being obedient but straightforward or spontaneous, compliant but autonomous. If mother has this belief, she won't ask him/her to obey, instead she will facilitate deliberate acts of the child using other skills. For example, she will collect and clean up wooden blocks spread in the room herself, but then asks her toddler to put the final piece into a toy box and says "Wonderful, you cleaned *everything* up!". As described above, "babyhood teasing", which was reported by Benedict (1946) and Clancy (1986) as a common socialization technique used by Japanese mothers to discipline their children to be compliant with them, is considered as to be based on this maternal idealism.

Evidence of this can be seen in the study by Miyake, Campos, Kagan and Bradshaw (1986). They examined different effects of mother's vocal expressions on social referencing of 11-month-old infants to them when he/she approached an unknown object and compared the results between Japanese and American children. The results showed that Japanese mothers' angry voices prolonged the latency with which the infant resumed play as much as three times that of American pairs. This fact can be speculated as not only was the direct anger expression of the mother stronger to Japanese infants, but also that Japanese pairs would need to take much time in negotiation to clarify the real meaning of mother's anger. The Japanese children withdrew toward the mother, in spite of the fact that she had expressed anger, and stayed near her.

The characteristic distribution of attachment types found in Japanese infants (Miyake, Chen & Campos, 1985; Miyake, 1990; Takahashi, 1986) also appears to show evidence to be interpreted from the viewpoint of mother-child negotiation. Those studies found that the occurrence probability of C-type infants (ambivalent attachment) in Japanese samples appears about 1.5 times as large as in the U.S. ones (eg. Ainsworth, *et al.*, 1978), while A-type infants (avoidant) were quite rare though this is the common insecurely attached type in Western samples. In a survey which includes almost 2,000 attachment type classifications obtained in 32 researches from 8 different countries including Japan, van IJzendoorn & Kroonenberg (1988) confirmed the uniqueness of this tendency. They concluded that the C-type emerges as relatively more frequent in Japan (and Israel) and the A-type more prevalent in Western countries, espe-

cially in Western Europe. Researchers have explained that this characteristic difference in distribution of the attachment types in Japanese samples was caused by the impropriety of Strange Situation Procedure for Japanese infants, because the measurements were gauged to the Ainsworth's *standard* procedure which is supposed to provide infants only "moderate" distress (Ainsworth *et al.*, 1978).

It may be difficult for Japanese infants to have recovered from destress suffered from the separation from the mother and meeting with a stranger because Strange Situation Procedure seems too "strange" for Japanese infants. Though this popular interpretation appears to be correct, there is another possible interpretation from a viewpoint of negotiation seems to remain. The "ambivalent" suggests that it took a prolonged time for the child to start to play with the mother though he/she appeared to have calmed down in the Reunion session. Thus they may have engaged in *negotiation* to explore and to communicate their intersubjective feelings, perhaps, feelings of *amae*. This interpretation seems to be relevant to the fact that the greater occurrence of C-types and almost non-occurrence of A-types does not offer the room for such intersubjective negotiation. Ambivalent behaviour of Japanese infants classified as C-type may not actually indicate the insecure attachment nor maladaptation, but rather it would demonstrate negotiation which they have learned under the *amae* relationship with the mother. Therefore, their 'insecurity' in attachment dose not have a consequent influence of their future socio-emotional activities.

It is concluded that not only attachment behavior but also general mother-child interactions may be heavily overlaid with cultural prescriptions. We need more systematic consideration of culturally guided *parental theory of child development*, "culture-specific folk theories" (Bretherton, 1992).

However, unfortunately, there are no relevant studies which have examined empirically the process of interaction in the abrupt changes in mother-child relationship in Japanese toddlers from this viewpoint. Moreover, the exact meaning and definition of *amae* has also not been established and is still controversial (Kumagai & Kumagai, 1985), except that it is clear that it means "relationship with the other." Doi (1977) did not attempt to offer a clear definition of it, because he regarded the meaning of *amae* to be too clear to explain it, at least to Japanese. He seems, in addition, to avoid intentionally presenting a single strict definition of it which would limit its universal power in explanating the Japanese characters. It is also true that he has not shown any empirical data related to child development except metaphorical statements, though he created a new interpretation or lexicon of *Amae* in ordinary Japanese terms and believed this supplies a conceptual tool for developmental psychology (Doi, 1990). Thus, we have to start to scrutinize the concept and to make an effort to construct a developmental theory appropriate to its cultural context to root it in our everyday Japanese life.

Finally, one can inquire whether these features of person-to-person interaction are unique or special to the Japanese society. My answer is YES and NO. Some similarities to that may be found in other societies more or less. I do not intend to insist on the idiosyncrasy of Japanese culture. However, it is embodied within Japanese society that children must learn to make much more fluid and subtle distinctions and to

step back and forth across the gap between outer and inner, appearance and real (Tobin, 1992; p. 24). Such a typical example of child development under the context of strong "parental theory of child development" would offer both an indigenous developmental theory like *amae*, and a more universal theory of culture learning processes in the course of child development.

4. EXPERIMENTAL OBSERVATION OF EFFECTS OF CHILD SEPARATION ON MATERNAL PLAYFUL TEASING INTERACTIONS

(1). Purpose

As discussed above, it is hypothesized that mothers engage in playful teasing expecting to attain mutual feelings of united enjoyment. On the other hand, Japanese mothers of toddlers are assumed to have strong expectation for child separation from them. Then, if their children show spontaneous sepatation, i.e. they physically separate and take the role of a playmate in interactions, maternal attempts of teasing would be more successful in eliciting laughter from the children. Nakano (1994a) categorized maternal teasing attempts into either "expressive" which is defined as the teasing actions accompanied with laughter or smiles, and/or exaggerated utterances or gestures, or "intrusive" which is the teasing action to surprise without any expressive emotion or features. In the study, mothers used both types of teasing generally. The results demonstrated that intrusive teasing actions of mothers elicited only distress from their 11-month-olds and fixed attention from 18-month-olds, but positive response to it came up from 28-month-olds and showed significant increase in child age 38-month-old. This developmental change was explained by the development of symbolic ability in children, but it may relate to child separetion. Intrusive teasing is annoying to a child because it includes fewer clues of the mother's playful motive. Then, if a child who is a un-separated, proximity seeker, and stays nearby the mother, receives intrusive teasing by the mother, who the child would be likely to feel annoyance because he/she has no other way of receiving it. However, if a child who is in a distant position from the mother, i.e. separate from the mother, receive it, he/she would escape from mothers treating attempts or cope with it more positively by deliberate adjustment of the distance from the mother by stepping back. In this observation, the relation between maternal teasing type and child separation is examined in a free play situation between mothers and their 2 or 3-year-old children.

(2). Method

Subjects: Subjects were 18 pairs of 2-year-old children (range of age; 16 to 28 months, the mean age is 26 months) and their mothers, and 24 pairs of 3-year-old children (range of age; 28 to 42 months, the mean age is 36 months) and their mothers.

Procedure: Each mother-child pair had 15 minutes free play in an experimental observation room (3m x 5m) containing toys such as a male adult mask and a puppet of Dracula (one of characters in a TV program for children) that would lead the mother to start playful teasing and to evoke mild surprise or fearfulness from the child. Before this session, a 10 minute warm-up served to encourage the pair to relax. The

free play session was recorded using two cameras, one focused on each partner, and were synchronized to form one picture. A digital time image was superimposed on the tapes.

Coding:

a. *Extraction of playful teasing episodes*: As a first step to data coding, maternal teasing episodes were edited from the videotapes of each 15 minutes observation. These episodes were defined as those situations in which a mother used the toys to show tickling, playful threats, or mildly surprising actions toward her child to evoke his or her playful responses. The onset of an episode was defined as the moment when the mother's action caught the child's attention toward herself or toward the toy, while offsets were when the mother stopped directing actions with the toy to her child just after the child's final response to her teasing actions.

b. *Coding system of couples of the mother's teasing actions with her child's responses*: Each teasing episode was reduced to a sequence of mother's teasing actions and the child's responses to them. Both mother's actions and the child's responses included verbalizations and vocal and non-verbal expressions which were coded by Unit Verbs to capture what they both did (eg. Mother *ANIMATE* puppet and Child *LAUGH*.). Those descriptions were accurately timed to within 1 second.

c. *Separate categorization of the mother's teasing actions and the child's responses*: Mothers' teasing actions were categorized into the following alternative categories based on the criteria whether they expressed clear play signs which would convey a metamessage of their play motives.

(1) Intrusive: Abrupt actions accompanied by non overt expressions.

(2) Expressive: Actions accompanied by positive expressions.

Children' responses to the mothers' teasing actions were categorized into the following four categories based on differences in their expressions.

(1) Unpleasant: Verbal or non-verbal responses to express their negative feelings or fixed attention to the mothers' actions inhibiting other expressions.

(2) Enjoyment: Joyful responses with positive expressions (laughter, smiles or joyful voices) or responses by pretending actions including imitations of the mother's actions and creative pretenses.

Separation from the mother: Children's spontaneous separation from the mother was defined as occasions when they positioned themselves out of the mothers' reach. The total duration of separation in a 15-min free-play situation was measured, then "Distant" and "Close" children were identified: Children who showed more frequent separation from the mother in the total duration than the age group average were identified as "Distant" children, while those showed infrequent separation were identified as "Close" children. The numbers of Distant and Close children in each age group were 9 and 9 in 2-year-olds, 13 and 11 in 3-year-olds, respectively.

Reliability: Two coders who were blind to the purpose of this study coded the data. Intercoder agreement of randomly selected 20 teasing episodes was 86.7%. Their judgments of children's spontaneous separation 10 children selected at random showed 92% agreement.

TABLE 1

Percentages of separation from the mother in DISTANT and CLOSE children.

		Out of Mother's Reach	Within Mother's Reach	Mean %
2 Year old	CLOSE	(n= 9)..... 82.8	17.2	45.6
	DISTANT	(n= 9)..... 25.9	74.1	
3 Year old	CLOSE	(n=11)..... 76.7	23.3	54.9
	DISTANT	(n=13)..... 18.3	81.7	

TABLE 2

Relation between child separation and frequency of mother-child interaction bouts.

	CLOSE	DISTANT	TOTAL
2 Year old (n=18).....	64.6 (42.6)	87.1 (57.4)	151.7 (100)
3 Year old (n=24).....	67.4 (55.2)	54.7 (44.8)	122.1 (100)

Numbers in parentheses are percentages.

TABLE 3

Interrelation between types of maternal teasing and children's reactions and physical distance from their mother.

		2-YEAR-OLD		3-YEAR-OLD	
	CHILD/MOTHER	Intrusive	Expressive	Intrusive	Expressive
CLOSE	Enjoyment.....	14.7	29.9	33.6	53.2
	Displeasure.....	85.3	70.1	66.4	46.8
DISTANT	Enjoymennt.....	36.6	34.0	30.3	55.1
	Displeasure.....	63.4	66.0	69.7	44.9

(3). Result

Children's separation from the mother: As table 1 shows, the occurrence rates of children's separation from the mothers in the Close and the Distant children was significant in both age groups ($x(1) = 29.8$, $p < .01$; $x(1) = 38.1$, $p < .01$; in age order). The average of children's separation also increased with age from 45.6% in 2-year-old to 54.9% in 3-year-old children. But this increase was not significant.

Frequency of playful teasing interaction bouts: Table 2 shows the mean frequency of interaction bouts of the Close and the Distant children in both age groups. Interestingly, mothers of 2-year-old children more often presented teasing actions to Distant children than to Close children, however, mothers of 3-year-old children, conversely, interacted with DISTANT children with lesser bouts of teasing actions than with CLOSE children and 2-year-old DISTANT children. This tendency was statistically significant ($x(1) = 4.3$, $p < .05$).

Occurrence rates of mothers' teasing types: Mothers of both the Distant and the Close children in both age groups similarly employed expressive teasing more often than intrusive teasing. There was neither significant differences between the separation

types nor between age groups in this tendency.

Inter-relation between child separation and maternal teasing types: The inter-relationship between child separation influenced by relation between mothers' teasing types and children's playful responses to them was examined in each age group. The results are shown in table 3. In 2-year-olds, the Close children expressed mostly unpleasant responses to mothers' intrusive teasing, while the Distant children enjoyed it much more than them. Mann and Whitney's U-test revealed that the difference depending on child separation is significant (CR = 2.57, p = .01). In 3-year-olds, however, no significant differences were found.

(4). Discussion

The hypothesis on the influence of child separation on mother-child interaction was supported in the 2-year-old group. Though intrusive teasing conveys less clearly the teaser's playful motive to the teased, the Distant children more often showed enjoyment of maternal intrusive teasing than the Close children, who showed non-playful reactions almost always to the teasing. This group difference suggests that children would need enough degree of physical freedom to buffer the intrusiveness of mother's attempts. The Distant children could have had much more the freedom and managed the intrusive teasing by, for example, stepping back. But it would be difficult for the Close children, who more often sit down close to the mother, to manage it. This interpretation concords with the fact that 11-month-old infants frequently expressed destress to intrusive teasing employed by the mother (Nakano, 1994a). Infants must be in the place close to the mother. However, why was the influence of the individual difference in child separation not found in 3-year-old children? This tendency seems to be contradicted because they showed separation and could manage the intrusiveness of the teasing more than 2-year-olds. This contradictory result would be interpreted by the consideration that mothers of 3-year-old children engaged less in interaction with their Distant children as the result shown in table 2 demonstrated. Mothers of the Distant children in 3-year-old group may have more or less *retreated from interaction with their children*, simply because the children had sparate from them.

Those results imply that child separation emerged newly in toddlerhood "*reconstructs*" *a new intersubjective negotiatory pattern* between mother and child under a new "scenario" that children have enlarged their capabability towards *incidents*. Child separation is considered as articulation of a culturally appropriate expectation of mothers. Their interactions thus would be able to *move* toward mutually seeking *a feeling of unitedness*.

Another implication of the results is that maternal actions are not necessarily the ones known as the "zone of proximity" (Vygotsky, 1932/1962) or "scaffolding" (Bruner, 1983). Why did mothers engage similarly in intrusive teasing to both 2 and 3-year-old children? If those concepts are available to the interactions observed in this study, mothers of 2-year-old children would not have introduced intrusive teasing to their children. Maternal playful teasing is characterized that mothers must employ it expecting not only to give enjoyment to their children, but also to share the pleasure with them, as Trevarthen (1994) also suggested. In mother-child interactions they

would perturb the ordinary pattern to attain enjoyment. This may be because of incident-affinity which was discussed in a previous section of this paper.

5. CONCLUSION: FOR RECONSIDERATION OF CROSS-CULTURAL STUDIES ON CHILD DEVELOPMENT

There have been numerous cross-cultural studies on differences of caregiving styles and quality of mother-infant interaction, and child developmental processes between Western and Oriental societies, especially Japan and United States. The Japanese has been targeted as an attractive counterpart to constrast with the American society and an ideal field to make evident the effects of social factors on human development because Japanese is technologically and materially just as advanced as any Western country, whereas they seem still to keep idiosyncratic manner and value patterns distinct from Western world (Shwalb *et al.*, 1994). The general conclusions of these studies come to the common point that American parents think of child as an individual and expect the child to be autonomous, whereas in Japanese society people are seen as being more interdependent and children are socialized towards their direction through social members including parents. Japanese mothers employ more proximal modes of communication, especially physical contact to soothe their babies, who are quieter and more inactive, while American mothers often use vocal expressions to stimulate their infants activities and their babies are more active (see Markus and Kitayama, 1991 for a review).

However, as Shwalb *et al.* (1994) pointed out, those studies only focused on replications of the results found in the Western countries and explained the cultural differences in relation to Western norms and only discussed higher or lower results have been discussed. This attitude that Western measures can be applied to non-Western societies and trying to *make up* differences in results of the measures can be criticized as depicting ostensible cultural differences considering neither the original contexts of the measures nor the social validity of the societies. To scrutinize whether the cultural differences found in previous studies are consistent, Bornstein (1989) reviewed 11 studies on motor activities in infancy which compared the Japanese and the American samples to find the origin of cultural influences on child development in both societies, and found many varieties in their results. His finding suggests that cross-cultural comparisons which simply apply the same measures to different societies can never create significant, cogent theories as far as they have an *intra-cultural background theory of child development*. Many cross-cultural studies seem to include this problem. One typical example can be found in attachment studies on Japanese infants (Miyake, Chen & Campos, 1985; Takahashi, 1986; Miyake 1990). As I discussed before, those studies have not provided any perspective on mother-child relationships and child development in the Japanese society, but have shown the limitation of Strange Situation Procedure which was standardized using American samples (Ainsworth, *et al.*, 1978).

Fogel (1993) claimed that cross-cultural psychologists use "culture" as an independent variable much like "social class", but 'culture is a *system of meanings* that mediates relationships between individuals and their environments' (p. 161). Bruner (1993) also pointed out that 'culture is not a set of responses to be mastered, but a

way of knowing, of constructing the world and others' (p. 516). Intra-cultural child development, culture learning (Tomasello, *et al.*, 1993) in other words, may be achieved as actualization of his/her universal co-operative motives (Trevarthen, 1988) in interactions with other members in the culture who communicate such a system of meanings, especially in interactions at developmental turning points like child separation in the Japanese culture. The challenge for us is to elucidate this process.

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TOWARD A THEORETICAL DEVELOPMENT OF PHYSICAL ACTIVITIES FOR CHILDREN WITH HANDICAPS: MOTOR, MOVEMENT, AND ACTION.

Atsushi Nanakida
Hyogo University of Teacher Education

Abstract

The purpose of the article is to describe a research paradigm of motor domain for children with handicapped conditions. After historical overview with of perceptual-motor theories, movement skill development and current perspectives on action are discussed. Purposeful movement approach is emphasized for the physical activities for the handicapped in order to accomplish a movement problem.

Key words: Handicapped conditions, motor development, movement education, action.

Introduction

Not only motor development but also general physical activity of young children have received considerable educational attention in recent year. Especially, concerns and aspirations for children with handicapped, particularly mentally retarded and other children with learning problem, have been primary in directing our attention to the potential contributions of movement experiences in other aspects of development and education. Because of deficiency in some aspect of gross and fine motor development, these retarded children fail to explore and move about the environment, and thus, reduce sensory awareness and incidental learning.

The central focus in special education has been, however, on keeping to describe that the effectiveness of a remedial/therapeutic training program on the improvement of motor abilities is dependent on the tasks presented to the children. Despite well documented and justified pleas for moving beyond such descriptive research, there is a need for more of it in certain area. Most of the available data are quantitative in nature: how far, how fast, how high. Qualitative descriptions, however, are lacking. Also, a number of qualitatively different movements may produce the same quantitative score (DiRocco and Roberton, 1981). What is the relationship between qualitative and quantitative performance? It has been suggested that the movements of some handicapped populations are characterized by greater quantitative than qualitative deficits (Roberton and DiRocco, 1981). Similarly, Campion and Brown(1976) have argued that the study of the qualitative deficits of performance may shed light on the nature of human ability.

Research in motor development has benefited from technological advances in new and refined techniques for analyzing the qualitative aspect of motor behavior. While studies employing these technics have provided valuable information, such as data on spontaneous motor control in babies (Thelen, 1985), and interception of moving objects by babies (von Hofsten, 1979), these point of view from action including in motor control and coordination has been a more important development. There has been a shift away from focusing on the tasks that children are performing to a focus on the children themselves as movers. Unfortunately, there is no specific research which had attempted to explain the performance of individuals with handicapped in terms of a given theory (Hoover and Wade, 1985). Also the number of research presentations at the meeting of Japanese Special Education Association has decreased gradually in resent years.

This review treats as subjects matter the main theoretical development for physical activities for children with handicapped leading to the adoption of the movement skill development model. Further, the purpose of this paper is to bring to the attention of practitioners and researchers the key role of movement skill in action systems, which emphasize the purposeful movement, and can be useful in teaching physical activities to children with handicapped conditions.

Historical overview

The origins of research interests in motor development were in the efforts of physicians and psychologists during the 1920s and 1930s to devise developmental scales. Observations of motor of infants and young children have been used as indicators of progress in development (Gesell, 1940; Shirley, 1931; Bayley, 1935), relied heavily on observation of motor development during the first and second years of life because verbal and personal social skills were less well developed and more difficult to observe during these years. Interest in motor development was dormant during twenty-year period from 1940 to 1960. The few studies were along the lines of age-sex comparisons and physical growth correlates, and were the results of continuing interest of limited number of researchers.

A revived interest in motor development came in the wake of educational concern for children with learning problems. Although beginning with mentally retarded children, all types of educational concerns soon were included along with the involvement of a wide variety of professional personnel in education, medicine and psychology. Motor development is a key aspect of many theories or suggestions proposed to explain learning problems and movement experiences are included in many educational programs for children with learning problems. Speculation by psychologists about relationship of motor development and perceptual-cognitive development provided the main impetus for mind-body interactions and inadequacies.

Over 50 programs for perceptual-motor had been developed by the early 1970s (Austin, 1974). Three of the most influential perceptual-motor theorists were Kephart (1960), Frostig(1970), and Barsch(1967), whose programs had tremendous impact in the field of special education not only in the United States but also in Japan. Dr. Kobayashi, a leader in this movement in Japan, observed in one of his books based on Frostig's theory that "much of the motor problems of the handicapped child appears to

be due to lack of integration of perceptual and motor systems, as well as the failure of the visual perceptual processes to provide substantial and clearly structured patterns for the motor actions to follows"(1986).

Reid(1981) pointed that these rather oversimplified models postulated that motor experience and proficiency were prerequisite to optimal perceptual function, which in turn was prerequisite to cognition, including academic task such as reading and arithmetic. Most of the research studies in this area are inadequate in fundamental aspects of sampling, testing, designing and analysis; results are inconclusive or negative (Myers and Hammill, 1976). The decade of research in this area has provided little of theoretical and empirical value (Cratty, 1989; Keogh, 1978, 1979). Recently in U. S. A, the borad of Trustees of the Council for Learning Disabilities(1986) recommended "a moratorium on assessment and training of perceptual and perceptual-motor functions in educational programs" (p. 247).

A shift from motor to movement

As the perceptual-motor theories in the past tended to be descriptive, current researches and writing now look at children themselves and the process that occurs as they move. Many authors (Keogh and Sugden, 1985; Gentile, 1975; Curtis, 1987) have expressed view points in which children are seen as part of a dynamic interaction between themselves and their environment. Movement is seen as a process of change resulting from both internal and external influences, it is a dynamic component in young children's development. This change of focus is very compatible with current research and practices in young children.

Keogh and Sugden(1985) defines it as follows; Motor will refer to the internal motor system, and movement will be the an observable behavior than with internal motor functions. After all, movement is as seen as a results of the neuromotor system causing muscles to contact and limbs to move in timed sequences. Human interactions take place in a psychological as well as biological environment—the "inner surround," as the researchers of movement (Teeple and Williams, 1977: Keogh and Sugden, 1985; Curtis, 1987) refer to them. The "outer surround" is the traditional environment in which human beings move.

A movement skill is an organized sequence of movements directed toward a desired outcome. Movement of different body parts must be coordinated to produce a total movement, whether it be arm and hand movements to reach and grasp an object or more continuous leg and arm movements to walk across a room. A movement skill is also adaptive in terms of altering movement organization to adjust to different environmental conditions, as when walking uphill or downhill and on smooth or bumpy surfaces. Adaptive capability is also seen when using the same movement skill in different movement situations, whether it be turning a bolt in a threaded hole or turning a knob to dial a radio station (Keogh, 1977).

Movement skill problems of children range from complete lack of movement to general impressions that movements are not graceful or are ineffective. Included within these broad limits are children who are unable to walk or reach and grasp as well as those who have difficulty translating into movement what they see or imagine,

as when trying to copy figures or draw pictures, or who have difficulty adjusting to context changes, as when trying to catch a bouncing ball. Inadequate development of the neuromotor system and related biological support systems will limit the development of control of basic movements. Inadequate development of information processing capabilities, particularly of perceptual-cognitive skills, will make it difficult to adjust to environmental conditions and task requirements. A general division of personal resources and movement outcomes along these lines provides a framework for thinking about movement skill problems of children.

Sugden and Keogh(1990) illustrated two examples as common movement skill problems in children with handicaps which are movement stereotypies and hyperactivity;

> Movement stereotypies, which are common among autistic, blind, and mentally retarded children, include rocking, hand lapping, and similar rhythmical movement repeated in a cyclical manner. Movement stereotypies also are seen early in the development of many babies and young children, but not to a marked extent and not at older ages. Hyperactivity is a matter of a child moving too much, often at inappropriate times. Explanations for hyperactivity include inability to inhibit movement and leaning to use hyperactivity as a means of coping with personal-social and other environmental requirements. Movement stereotypies and hyperactivity are examples of problem of movement control (p. 6).

Based on concepts of movement skill development theory, movement education (Motopedagogik) approach was devised by Kiphard (1979, 1983) and was originally intended for children aged 5 to 12 years who were emotionally disturbanced, mentally retarded, physically handicapped, or in other ways disabled. Programs of this approach have been used for more than 20 years in the Germany and have shown good results especially in outpatient therapeutic interventions for children with handicapped conditions (Doll-Tepper, 1989). The component of this approach involve (a)training the sense such as touching, hearing, and seeing; body schema exercises and exercises/games involving body and spatial orientation; (b)training self-control and carefulness, for example walking noiselessly, balancing exercises involving dexterity, (c)rhythmic and musical exercises/games including exercise/games in rhythmic and dynamic movement, and listening to and moving to music; (d)training inventiveness and role-playing such as inventive activities/creative games, improvisation and imitation of animals, acting out situations, occupations, and so forth. Kiphard's approach emphasizes the importance of body experience as well as material and social experience through movement in order to improve the individual's competence-learning through movement. By improving movement ability, emotional stability is achieved, thus providing the child with a basis for further learning. The overall aim of this approach is to develop and further the capacity to act as independently as possible so that the child can usefully cope with him/herself and the environment (objects, materials, other people). Empirical and theoretical studies of movement skill problems have been concerned almost exclusively with the influence of movement experiences on perceptual development and

how changes in perceptual development lead to changes in cognitive development and related school achievement. However, very little attention has been paid to how changes in perceptual development lead to changes in movement skill development.

The expansion from movement to action

A computer analogy is used to view a human as a self-regulatory system capable of receiving, processing, and transmitting information. The information processing approach focuses on the use of information to organize and adjust movements in relation to environmental conditions and task requirements. Movements are seen that organized on the basis of motor programs, which can be stored for future use and modified and extended by additional information.

Information processing capabilities thus became central in understanding how movement skill is controlled and modified in 1970s. The involvement of sensory, perceptual, and cognitive processes in human behavior is the fundamental concern in information processing, an approach that has dominated the study of movement skill over the last 20 years (Martenuik, 1976; Stelmach, 1976, 1978). Adams' servo-loop (after Craik, 1947) and errornulling ideas in his closed-loop theory (Adams, 1971) representing an electronic-like system are transformed into the cybernetic-like subroutines of schema theory (Schmidt, 1975).

Recently, there is a growing interest in the study of "action" instead of "movement" (Newell, 1981; Reed, 1982; Turvey, 1977; Whiting, 1980; Fres & Sabini, 1985). Information processing theories have been criticized because of their artificial character. That is to say, they are regarded as being derived from the simplistic movements of experimental subjects required to perform in an impoverished environment, often devoid of vision and confined to rather static and unnatural conditions (Newell, 1981). For example, the action perspective advanced by Turvey(1977) in the domain of motor skills can be seen as a reaction against the ubiquitous computer analog; we would be reminded that human beings are, after all, interacting with environments and not data processing machines.

The research approaches (Thelen, Kelso, and Fogel, 1987; Kugler, Kelso, and Turvey, 1982; Turver, 1977, 1990; Newell, 1992) will be discussed in terms of how one views the nature of movement skill development and what are likely avenue of research. The nature of movement skill development is what one views as the phenomena to be identified and understanding. Recent approaches to studying movement skill were identified by Kelso(1982), more dynamic approach than traditional one, which is action emerges from relationships governing the current state of involved systems and processes and existing environmental conditions and task requirements, rather than being a one-way or hierarchical organization that flows from information input to effecter output. Such perspective of action is derived from the direct perception view of Gibson (1966, 1977) and the ideas of Bernstein(1967) about organization of movement.

Gibson proposed that information is directly perceived and does not need elaboration by the individual. Information is rich in itself and is composed of events that continuously unfolded (Reed, 1982). Events have a wholeness and totality, rather than

being a series of single instance images that need to be processed or transformed. The interaction between environment and individual is all important, with invariants specifying the persistent properties of the enviroment that the individual knows. The invariants specify objects, places, and events, but they cannot be considered separate from the individual. Gibson (1966, 1977) believes the environment affords actions that are relevant to the individual. An environmental situation containing a number of invariant will afford different actions to different individuals.

Utilizing an ecological perspective, Burton(1987) explained that movement problems often found in children with disabilities might, in some cases be due to problems in perceiving what the environment affords for action. In 1990, Burton suggested a possibility that developmental disabled children who have movement problems have the normal-like perceptual sensitivity to the relationship between their personal constraints and the constraints in the environment in a movement context. Block(1993) indicated that the children with mental retardation were able to accurate perceive the affordance for jumping distance.

On the other hand, Bernstein(1967) approached the problem of how movement is organized by focusing on the problem of how so many variables could be constrained into a behavioral unit. He proposed that organization, which he identified as coordination, depends upon limiting the degrees of freedom related to the many variables involved in producing a movement. As reviewing the researches of movement skill learning of mentally retarded individuals, Newell(1985) criticized these studies as dealing only with control and not with coordination and skill.

Thelen(1986), in her systems account of Bernstein's perspective, identified eight components or factors contributing to locomotor skill and proposed that some of these components are "rate-limiters" that constrain the emergence of locomotor behaviors. That is, even if all other components are ready to support bipedal locomotion in a given child, one or two rate-limiters that are not ready, such as postural control and extensor strength, would keep that child from beginning to walk. In this developmental context, Thelen(1986) emphasized the importance of identifying the components that are rate limiting in explaining the emergence of locomotor milestones. Similarly, when assessing children with movement problems, it is important to determine which specific components or factors are limiting or constraining their movement behavior. A list of important components or factors shaping and influencing the motor behavior of handicapped and nonhandicapped children should include body size/morphology, muscular strength, cardiovascular endurance, flexibility, perceptual accuracy, postural control, the degree of coordination between body components, and the degree of control over the coordinated units. The potential of some of these factors to act as rate-limiters in the movement behavior of handicapped children has been demonstrated (e.g., body size-Dobbins, Garron, & Rarick, 1981; motor control-Davis 1986), but there is little research that would prompt a practitioner to consider perception as possible rate-limiter of the action of a child with movement problems. Not only is information directly perceived, but organization of movement emerges from the dynamics of relationships governing the interplay of variables involved in perception and action, coordination thus is like an equation in which the outcome is a function of higher order rela-

tionships among variables, including the status of the variables. Movement emerges as the solution of an equation. That is, Bernstein(1967) noted, the organization of movement action can be considered as the solution of a movement problem. The individual is confronted with a problem, whether the sources of the conditions creating the problem be internal or external to the individual. According to Savelsbergh and Van der Kamp(1994), exploratory behavior which leads to an effective solution for a movement problem is very important in both the direct perception view of Gibson and Bernstein's perspective. The nature of movement skill development is, when an individual faces with the movement problems, the organization of the plan of action and the execution of the movement process.

Purposeful movement and handicapped individuals

Matters with handicapped conditions become more complicated when including movement use as part of an action system, but action systems within the context of environmental consequences must be studied. As definition by Elliot and Connolly (1974) that movement skill is an "organization of actions into executed with economy (p. 135)", a key to solve this complicated problem is the purposeful movement. Purposeful movement may be defined as movement activities involving an objective beyond the actual performance of the movement itself, that is, movement being performed as a means to an end, not as an end in itself (Gliner, 1985; Hinojosa, Sabari, Rosenfeld, & Shapiro, 1983).

In this context, then, purposeful movement changes the focus of performers from themselves and the movement being performed to environmental cues for moving and the higher level objective of the activity. Further, purposeful movement may be more motivating than nonpurposeful movement and may even result in greater physiological benefits than nonpurposeful activities. The importance of purposeful activities in remedial programming has been acknowledged by occupational therapists for many years (Gliner, 1985; Hinojosa et al., 1983) and has been supported by research reported in the occupational therapy literature (Kirchner, 1984; Steinbeck, 1986).

Kirchner(1984) had 26 female subjects perform rhythmical jumping with and without jump ropes and measured the heart rates at which they reached the subjective point of "very hard work" on the Borg Scale of Perceived Exertion (this usually relater to an actual heart rate of approximately 170 beats/min). In comparing the two conditions, she found that the heart rate increase and the amount of time taken to reach the given point of exertion was greater with the rope, suggesting that the women were working harder and longer at the same level of perceived exertion when the jump rope was used. Steinbeck(1986) reported similar results when male and female subjects were asked to pedal or squeeze a rubber bulb in both purposeful and nonpurposeful context until they were working "somewhat hard" (equivalent to a heart rate of about 130 beats/min on the Borg Scale). Yasui(1991) suggested that active jump training in purposeful context has more positive effect on the not only cardiovascular system but movement confidence than passive jump training on the trampoline for Down syndrome children.

A purposeful context may also be provided through sports and games in physical

activity for the children with handicapped. Auxter and Pyfer (1985) suggest there are two approaches to teaching adapted physical education; task-specific or "top-down," and developmental or "bottom-up." The task-specific approach involves teaching a specific skill directly, in as normal a context as possible, and moving down to work on general abilities or basic input/output systems only as is necessary for a particular skill. Conversely, the developmental approach being at the bottom (i.e., with basic input/output system), works up through general abilities, and teaches the student specific skills only after these building blocks are in place.

In order to provide the most purposeful setting possible, Burton(1987) recommends that the task-specific approach should be always considered first and the developmental approach used only in special circumstances.

Conclusion

The main thrust of this paper has been to focus attention on theoretical development for motor domain of with handicapped in terms of role of action systems in organizing movement processes. Particular emphasis has been placed on the need to identify qualities and characteristics of movement processes in order to explain and to identify or infer mechanisms and their functioning. An important methodological consideration is that more sophisticated observation and analyses of action in real world and performance components will be required rather than the traditional use of performance data.

In connection with using more conceptual and theoretical formulation, researchers are using an earlier research methodology of making detailed observations of movements and related behaviors, although now as a means of identifying organizational qualities of movement process and inferring underlying mechanism and their functioning. The current emphasis upon understanding this process including in motor control and coordination is more conceptual and theoretical than were earlier approaches to studying movement skill development.

The perspective of action is derived from the direct perception view of Gibson (1966, 1977) and the ideas of Bernstein(1967) about organization of movement skill for children with handicapped, which order emerges from the dynamics governing relationships among relevant variables, which are presumed to be known directly. Dynamic interactions among the systems determine the course and quality of movement skill development. Our interest in the development of personal resources is that movement skill problems can be traced to inadequacies in development of personal resources, such as the neural limitation in cerebral palsy, which restrict basic control of posture, locomotion and manipulation, or loss of vision, which makes it difficult to use locomotor skills for traveling in the environment. This leads to a search for governing relationships that enable the many variables involved in movement to function in concert and is true particularly in extending the study of movement skill to include develop mental issues.

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POSTURE AS A DYNAMIC STABLE STATE OF A BODY

Norimasa Yamada
Hokkaido University

Abstract

An upright posture is a coordinated stable phenomenon of the whole body relative to its external environment and the task of maintaining posture involves a complex sensorimotor control system. Such a global and complex phenomenon needs to be explained from both macroscopic and microscopic points of view. In an upright posture the body sways. Time variation of the center of pressure (COP) under the feet was used as an index of the macroscopic phenomenon of a swaying body in the upright posture and its dynamic properties were analyzed using dynamical systems theory.

Chaotic swaying was found in the movement of the COP under a subject's feet when standing still and when standing while swinging the upper limbs. Proof of this chaotic swaying was shown by reconstruction of the dynamics in phase space and calculation of the largest Lyapunov exponent. The properties (geometry and dimension) of the chaotic attractor observed when the upper limbs were swinging were similar to that of observed when the subject was standing still. This result suggests that posture and movement are adaptively and flexibly integrated.

Mathematical techniques from information theory were applied to the analysis of the ability of information processing of the COP chaos. This novel approach led to extracion of the ability of the COP chaos to receive information fed from the outside. As the ability of receiving information of the COP chaos was superior, chaotic swaying was rational from the viewpoint of information processing. Therefore, it is thought that chaotic swaying of the body is a dynamic stable state of the body while receiving information from many segments within the body and its external environment.

keywords: posture, chaos, dynamical systems theory

Introduction

Because posture has been treated as a static stable state of a body, most of the past studies in postural control (Moore et al. 1988; Woolacott et al. 1988; Diener et al. 1988; Horak et al. 1990; Diets et al. 1991) have focused on analyzing the response of the body to various external perturbations. In these past studies, a dynamic characteristic of the center of pressure (COP) under the feet that is known as a stabilogram, (Figure 1b) was ignored and static characteristics of COP, i.e. calculation of the length of the sway path, and the average radial area were studied.

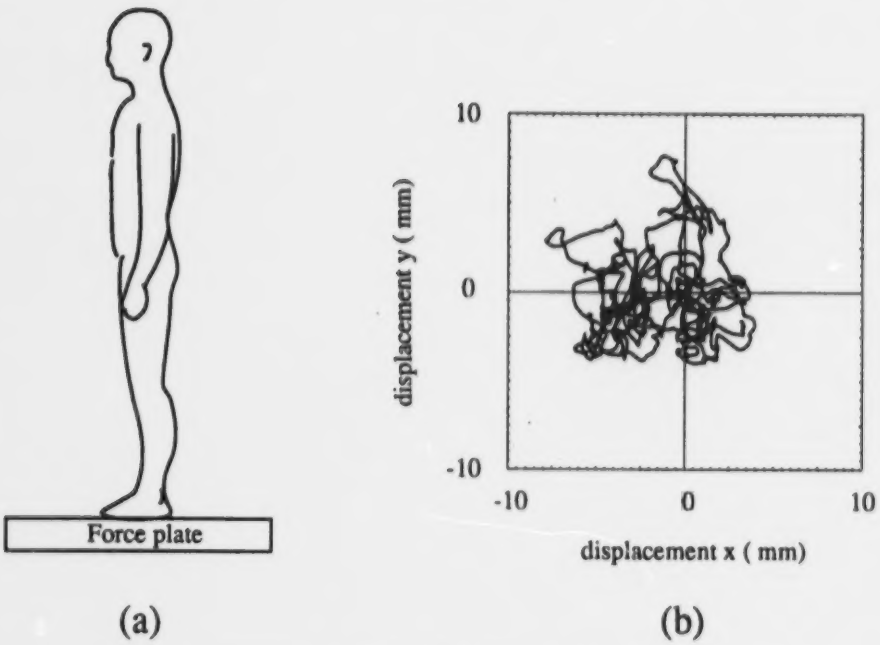

FIGURE 1 (a)Upright posture, (b) Typical 50－s stabilogram for a healthy subject during quiet standing. The COP under the subject's feet moves relative to a global coordinate system.

On the other hand, Collins and Luca (1993) analyzed the dynamic properties of the COP trajectories using random walk analysis when the subject was standing still. They reported that COP trajectories could be modelled as fractional Brownian motion and that at least two control systems: - a short-term mechanism (open loop control mechanism) and a long-term mechanism (closed-loop control mechanism) - were operating during an undisturbed stance. These results suggest that posture control needs to be analyzed the same way as voluntary movement control and should not only be based upon the input/output characteristics of the simple postural system.

Some doctors and researchers have reported that movement and posture are not separately controlled but tightly integrated. Thelen and Fisher (1982) showed that when 1-month-old and slightly older infants were submerged up to their chests in warm water, stepping patterns were seen which would not normally be seen due to the weight of the limbs. Reed (1989) pointed out that if postural support can yield such a dramatic change in behavior, it would seem unreasonable to limit the effect of posture to that of simply a stabilizing mechanism response to perturbation.

In this study, posture was considered to be a dynamic stability of a continuously moving body. In the hypothesis, we did not divide human movement into a static state (commonly called posture) and a dynamic state (commonly called movement). We considered posture and movement to be adaptively and flexibly integrated. To test this hypothesis dynamical systems theory was applied to analysis of dynamic behavior of

the stabilogram. The theory has provided many new tools with which to analyze non-linear phenomena in physical systems.

Methods

Experimental methods

Five healthy subjects, aged 21-34 years, were used in this study. The subjects had no evidence or known history of a gait, postural or skeletal disorder. Postural stability was evaluated by using a force platform (AMTI model OR6-5) to measure the time-varying displacements of the COP under a subject's feet. Each subject was instructed to stand in an upright posture in a standardized stance on the platform for two different experimental conditions. . The experimental system is depicted schematically in Figure 2. In the first experiment, the subjects stood barefoot with their arms comfortably at their sides and their eyes open and fixed on a point in front of them. In the second experiment, the subjects stood barefoot while swinging their upper limbs like they were walking in time to a periodical sound from an oscillator, and with their eyes open and fixed on a point in front of them. The frequency of the oscillator was 1.5 Hz, then 1 period, during which they swung their arms, was 0.75 Hz. Each experiment lasted for a period of 200 seconds and the force platform data were digitized to a resolution of 12 bits, sampling at 100Hz.

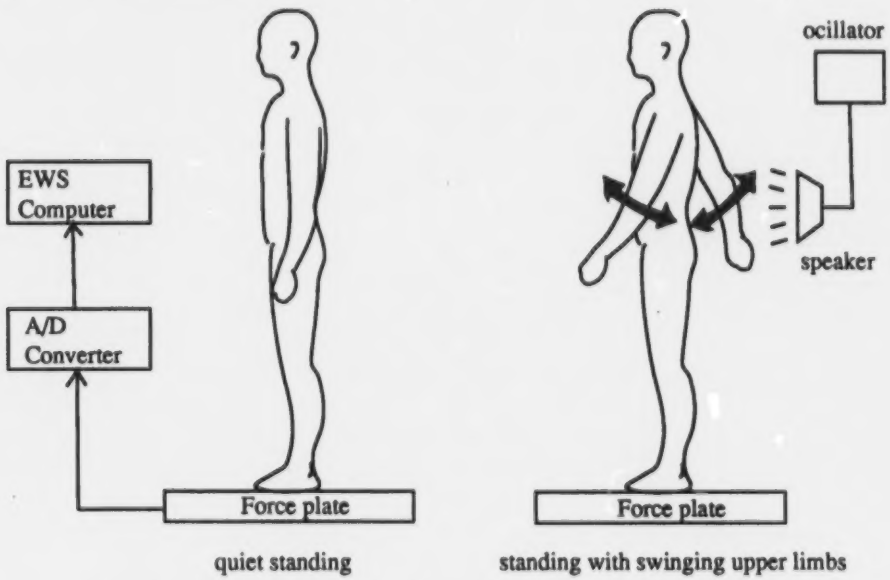

FIGURE 2 Schematic diagram of the experimental system. The healthy subjects stood barefoot on a force platform with their arms comfortably at their sides and the subject's eyes were open and fixed on a point in front of them (experiment 1). In the second experiment, the subjects stood barefoot while swinging their upper limbs as if walking in time to a periodical sound from an oscillator. The time-varying displacememts of the COP over the plane of support were measured using the force platform.

Data analysis

COP time series

The COP trajectories were studied as a distance from the initial position. The COP data were filtered with a low-pass filter (cut-off 5 Hz). The COP data can be treated as one index for a swaying body.

Embedding and correlation dimension

The time evolution of a single degree of freedom, the COP time series, was used to reconstruct the attractor utilizing an embedding by time-delayed coordinates (Takens; 1981). A dimension of the attractor was calculated as a correlation dimension using an algorithm similar to that of Grassberger and Procaccia (1983). (Chaos Attracting System developed by Tsuda, Tahara, and Iwanaga (1992) was used. This software was also used to compute the largest Lyapunov exponent and mutual information.)

Lyapunov exponents

The exponential divergence of nearby trajectories underlies the sensitivity to initial conditions in the chaotic system. The Lyapunov exponents can be defined by studying the development of the initial conditions on an infinitesimal n-dimensional hypers-

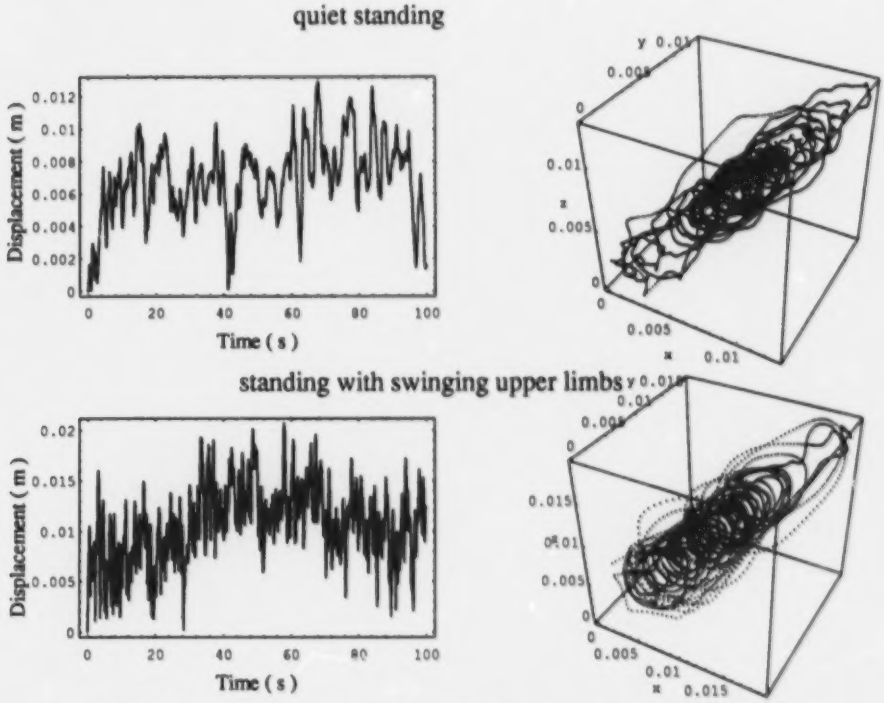

FIGURE 3 Typical time series of the COP data (left) in the case of standing still and when standing while swinging the arms, and the phase portraits (right) in the case of embedding into three-dimensions of the data.

phere. A system is chaotic if at least one of its Lyapunov exponents is positive. To determine whether the dynamics on the attractor of the COP data are chaotic or not, the largest Lyapunov exponent was calculated. To compute the exponent, an algorithm similar to that of Wolf (1985) was used.

Spectrum analysis

Spectrum analysis was often used for analyzing the chaotic system. Because a chaotic state is non-periodic, it contains a broadband spectrum. The Cooley-Tukey fast Fourier transform algorithm was used to calculate the power spectral density for the time series of the COP data.

Results

Figure 3 shows the typical time series of the COP data (left) when the subject is standing still and when standing while swinging the arms, and the phase portraits (right) in the case of embedding into three-dimensions of the data. As seen in Figure 3, the geometries of the attractors for the two experimental conditions were similar. The first Lyapunov exponents and the correlation dimensions for the COP data from two experiments are summarized in Table 1. Correlation dimensions of the attractors for both experiments of all subjects were between 2.1 and 2.5. The first Lyapunov exponents for both experiments of all subjects were positive, and the exponent for the experiment of swinging the arms was 0.5-1.5 larger than the exponent for the experiment when the subject was standing still.

Figure 4 shows the typical power spectra of the COP data when the subject was standing still (left) and when standing with swinging the arms (right). The spectra of the COP data when the subject was standing still contained a broadband spectrum. The spectral profile was almost flat over the frequency range of 0.01-0.3 Hz. However, the power spectrum over this range showed a curve approximately inversely proportional to the frequency (1/f spectrum). The spectrum of the COP data in the swinging

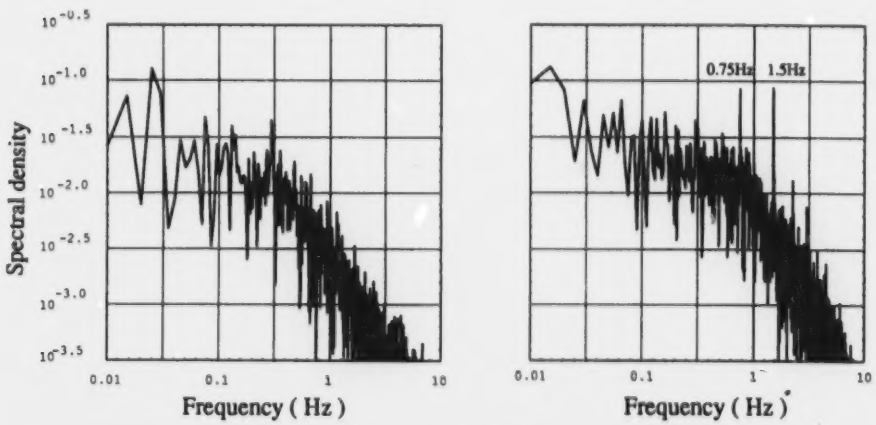

FIGURE 4 Typical power spectra of the COP data in the case of standing still (left) and when standing while swinging the arms (right).

arms experiment was characterized as follows:

1) The spectrum consists of two fundamental frequencies, 0.75Hz and 1.5 Hz, 0.75 Hz was the frequency of the swinging arms, and they were an integer combination.

2) The spectrum contains broadband frequencies that were observed when the subject was standing still besides the sharp components of 0.75Hz and 1.5Hz.

Discussion

Posture as a component of voluntary movements

As can be seen in Figure 1, we could obtain attractors from the COP time series of two experimental conditions using the embedding tachnique and the geometries of the attractors were similar. This qualitative similarity of the attractors was confirmed by calculating the dimensions of the attractors, which is one of the most widely used methods to characterize attractors. As seen in Table 1, the dimensions of the two attractors from the two different experimental conditions were similar too. An attractor shows an order or a constancy over the time of the phenomena that means a dynamic structure of the observing system. In this case, the attractor we obtained shows the structure of the dynamic system of the body swaying. The similarity of this structure implies that properties of the dynamic systems for the two experimental conditions were also similar. In the experimental condition of swinging the upper limbs, the body is obviously moving. In such a situation, the properties (geometry and dimension) of the attractor of the COP were almost the same as those of attractor for the case when the subject was standing still. Therefore, it is thought that there is a role for stabilizing the body dynamically in a voluntary movement. This hypothesis was also confirmed by spectrum analysis. The spectrum of the COP in the case of swinging the arms contains broadband frequencies that were observed in the case where the subject was standing still, besides the sharp components 0.75Hz and 1.5Hz that originated from the arms movements. By this stabilizing work in a voluntary movement when

TABLE 1 The first Lyapunov exponents and the correlation dimensions for the COP chaos from both experimental conditions.

Sub. /Condition	First Lyapunov exponent	Correlation dimention
A/quiet standing	0.91	2.3
standing with swinging upper limbs	1.70	2.2
B/quiet standing	0.98	2.5
standing with swinging upper limbs	2.07	2.4
C/quiet standing	0.57	2.3
standing with swinging upper limbs	1.70	2.2
D/quiet standing	0.60	2.2
standing with swinging upper limbs	1.92	2.4
E/quiet standing	0.51	2.1
standing with swinging upper limbs	2.06	2.5

there is a functional task beyond that of quiet standing, the postural patterns undergo task-specific reorganizations of an intricate nature. For this reorganization, it is thought that the chaotic swaying of the body is useful. We analyze this chaotic swaying of the COP further in the next section.

Why swaying of COP is chaotic ?

Comparing the two results from different experimental conditions, it is thought that the chaotic swaying of the COP, obserbed when the subject was standing still, plays an important role for the adjustment of posture. In this section, we analyze the role of chaotic swaying using mathematical techniques.

Sensory signals from muscles which are produced by each movement of the body, (hand, head, and so on) in turn produce specific spatio-temporal patterning of neural activities throughout the central nervous system. Therefore, it is worth studying the information capacity of the observed COP chaos, especially its ability for the transmission of information fed from the outside. In order to study this from experimental data, we used a new algorithm proposed by Matsumoto and Tsuda (1989). They considered a dynamical system as an information channel. The amount of information transmitted from initial condition i to the next condition at time j through the dynamical system can be computed using the mutual information:

$$I(i;j) = -\sum_{i} P(i)\log P(i) + \sum_{ij} P(i)P(j/i)\log P(j/i)$$

where p(j/i) is the conditional probability.

The amount of transmitted information is assumend to be the source information mimus the missing information during transmission. The mehod was expanded by Tsuda et al. (1992) to a calculation of amount and direction of the transmitted informa-

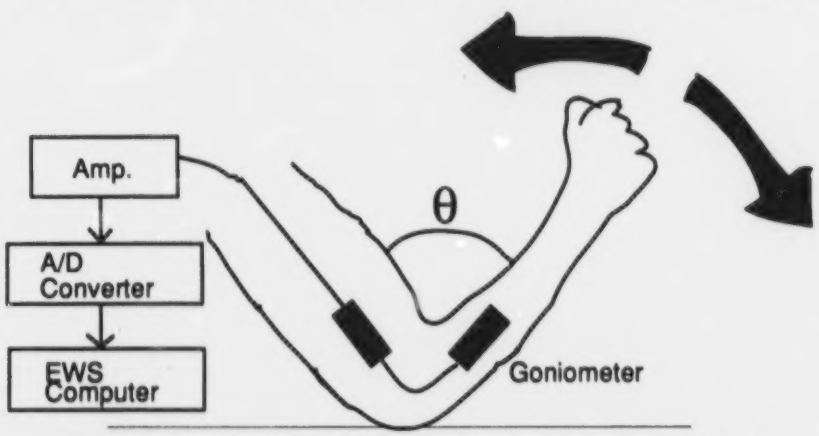

FIGURE 5 Schematic diagram of the experimental system for rhythmic and unrhythmic movements in the elbow joint. The subjects sat on a chair comfortably with their right arm on a desk. A goniometer was attached to the subject's elbow joint to measure the time vaiation of the elbow angle. During testing, the subjects extended and flexed their elbow joint with a constant rhythm (exp. 3). In experiment 4, the subjects extended and flexed their elbow joint irregularly.

tion relatively between two dynamical systems. They calculated the information ability of a capillary chaos found by them through the use of this method. Two time series were prepared to evaluate the information capacity of the observed COP chaos. Figure 5 shows the new experimental systems (Exp. 3 and Exp. 4) schematically to get the time series. The same subjects were instructed to sit on a chair comfortably with their right arm on a desk. During testing, the subjects extended and flexed their elbow joint in a constant rhythm (exp. 3). On the other hand, under the other condition (exp. 4), the subjects extended and flexed their elbow joint irregularly. A goniometer was attached to the subject's elbow joint to measure the time variation of the elbow angle. Each experiment lasted for a period of 20 seconds and the data of the goniometer were digitized to a resolution of 12 bits, sampling at 100 Hz. Figure 6 shows the typical time series of the angular data (left) for exp. 3 and exp. 4 and phase portraits (right) in the case of embedding into three-dimensions of the data. As can be seen from Figure 6, it seems likely that the phase portrait for the first experimental condition (exp. 3) is similar to a limit cycle attractor, and the phase portait for the second experimental condition, (exp. 4) is similar to a chaotic attractor. Information ability of the COP chaos was calculated using the two time series.

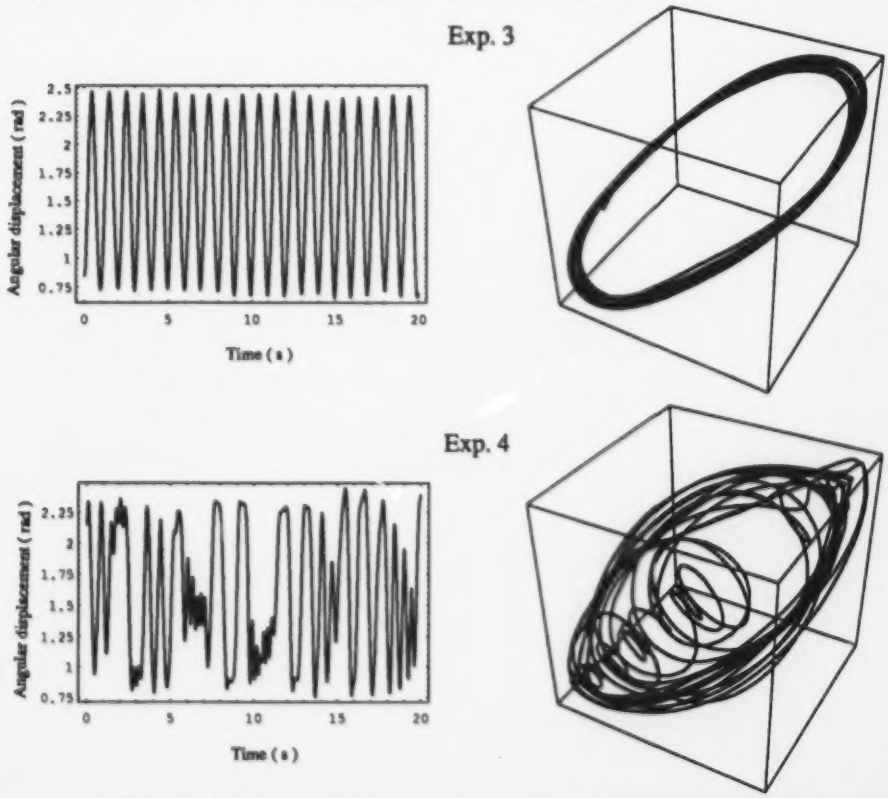

FIGURE 6 Typical time series of the elbow's angular data (left) for exp. 3 and exp. 4 and phase portraits (right) in the case of embedding into three-dimensions of the data.

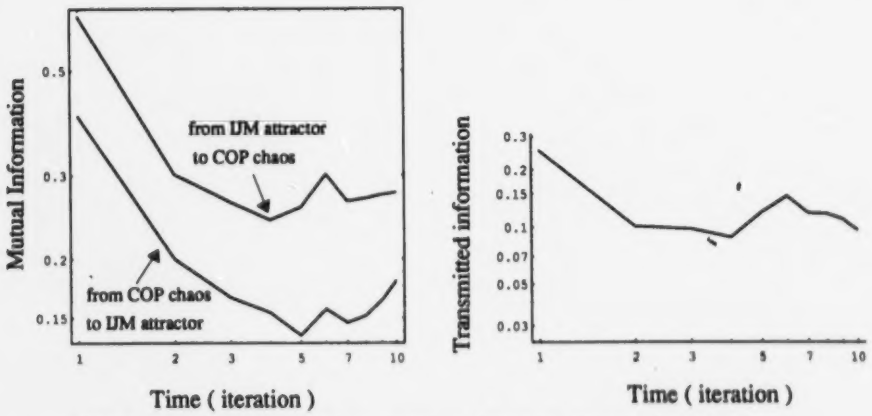

FIGURE 7 Typical time series of mutual information between the COP chaos in the case of standing still and the attractor constructed from irregular joint motion (IJM)(left). Time series of transmitted information from the IJM attractor to the COP chaos in the case of standing still (right).

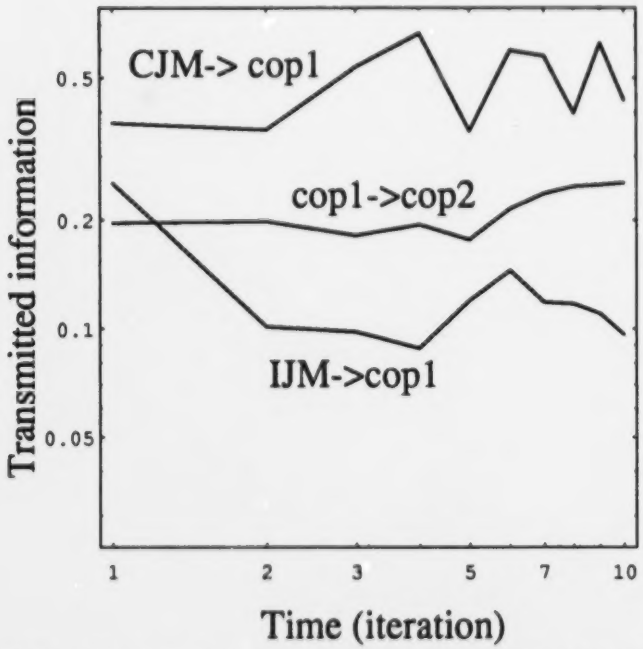

FIGURE 8 Typical time series of transmitted information from the attractor constructed from the joint motion with a constant rhythm (CJM) to the COP chaos in the case of standing still (CJM−>cop1), from the IJM attractor to the COP chaos in the case of standing still (IJM−>cop1), and from the COP chaos in the case of standing still to the COP chaos in the case of swinging the arms (cop1−>cop2).

Figure 7 shows the typical results of the calculation of transmitted information. The left figure in this shows the time series of mutual information between the COP chaos when the subject is standing still and the attractor constructed from irregular joint motion (IJM). The difference in this mutual information represents the amount of transmitted information. When these values are positive, the direction of transmitted information is from the IJM attractor to the COP chaos in the case of standing still. Adversely, if the value is negative, the direction is reversed. The results are shown in the right figure in Figure 7, where information is transmitted from the IJM attractor to the COP chaos in the case of standing still. In this way, transmitted information from the attractor constructed from the joint motion with a constant rhythm (CJM) to the COP chaos in the case of standing still, from the IJM attractor to the COP chaos in the case of standing still, and from the COP chaos in the case of standing still to the COP chaos in the case of swinging the arms are summarized in Figure 8. As can be seen in Figure 8, the ability of receiving information was most superior in the COP chaos in the case of swinging the arms. The order of ability of receiving information, except the COP chaos in the case of swinging the arms, is the COP chaos in the case of standing still, the IJM attractor. Furthermore, the CJM attractor only sent information in comparison with the other dynamical systems. For this reason, the ability of receiving information of the COP chaos is superior. Therefore, the regulating system for the posture composed in a voluntary movement can receive the information from many segments of the body as well as from the outside. If the swaying is regular like a limit cycle attractor or a point attractor instead of chaos, the regulating system for posture can not receive information from irregular movements of the body or from the outside. Finally, it should be noted that swaying of the COP which is chaotic, is rational from the viewpoint of information processing.

Acknowledgment

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Mentors For Japanese College Students

Kunio Wakai
Hokkaido University

1. Introduction

Guided by Vygotsky's idea which suggests that the activities and the person with whom children engage in the activities are the two 'locomotives' of their mental development, a Japan-US collaborative research project was launched several years ago. In the course of conducting several studies, it has been found that Japanese college freshmen show salient 'same-sex-peer-orientedness' when asked to name the important people (signigficant others) in their life, and that American parents play wider and stronger function roles on their children than the Japanese (Wakai, 1989). Factor analysis on the function roles of the significant others revealed five factors, namely 'Teacher', 'Challenger', 'Ego-ideal (Model)', 'Supporter', and 'Companion' (Matsuda, 1994).

As many psychologists note, social encounter and experiences are critically important for human development. Theoretically, as time passes our society is expected to move forward into more and more comfortable and supportive world. But enigmatically enough, as our highly 'developed' society changes, there are more and more people who suffer the difficulty and problems in human relation. The problem is particularly serious for young people, because they are just in the process of establishing ego identity and relationship with the outer world.

Although abundant studies have been done on adolescents, we still witness a paucity of evidence which shows what kind of social network they live in and who they find as the significant others. This study is a derivative of our cross-national study between Japan and USA on mentors, led by Urie Bronfenbrenner of Cornell University.

2. Purpose

The purpose of this study is two fold. One is to probe into the significant others for Japanese college students (Study 1), by adopting simpler method than that we used in the previous studies. Second, it was aimed at getting the firsthand data on how the contemporary Japanese younsters conceptualize 'Mentors' or 'Excellent Teachers' (Study 2), again by using more direct approach than that in our precedent studies.

Part of the results reported here was presented at the 13th Biennial Meetings of the International Society for the Study of Behavioral Development (ISSBD), June 26-July 2, 1994, Amsterdam, The Netherlands. The presentation was made possible by a travel grant from the Japan Foundation. The author expresses here his sincerest gratitude to the Foundation.

3. Methods and Procedures

A. Study 1.

1) Subjects. The subjects in Study 1 were 91 male and 75 female college students in the sophomore year, who were taking an introductory course of education taguht by the present author. In a year they are going to select the major fields respectively, ranging over all the disciplines.

2) Data collection tool (VIP Questionnaire). A simplified questionnare was devised to collect data on the important people (significant others). Subjects were asked to name a single person (hereafter, 'associate') among the people they thought very important and to state the associate's sex, age, occupation, relationship to the subject, the ages when the relation began and ended and reached to the peak (the most intensive).

3) Procedure. Using part of the regular class hour the questionnaire forms were distributed to all the students attended, and after a brief instruction about the purpose and the nature of the questionnaire they were requested to answer each question, beginning with naming a single person as a significant other. Subjects were also asked to write down the reasons (up to five) for the naming.

B. Study 2

1) Subjects. The subjects for Study 2 were 70 male and 71 female sophomores of the same college. Most of them answered the questinnaire for Study 1.

TABLE 1 Rating Scales for Mentor's Traits

A Professional capabilities	*B. Personal traits* (1)	*C. Personal traits* (2)
1. Knowledgable	6. In stable mood	11. Calm
2. Intelligent	7. Passionate	12. Poised
3. of special talent	8. Steady	13. Delicate
4. Logical thinking	9. composed	14. Patient
5. Insightful	10. Sensitive	15. Positive
D. Appearance	*E.* Greed/beliefs	*F. Attitudes toward self*
16. Tall	21. Having own firm ideals	26. Optimistic
17. Robust	22. A person of faith	27. Strict with self
18. Good shape	23. Having things to engage	28. Endeavoring
19. Handsome/beautiful	24. Having a strong sense of justice	29. Humble
20. Awesome	25. Perceptive with the world	30. Not self-depreciating
G. Attitudes toward others	*H. Teaching techniques*	*I. Personal impression*
31. Providing chances	36. Use humors	41. Degnified
32. Listen faithfuly	37. Not scold unreasonably	42. With a kind of dreadfulness
33. Give constructive criticisms	38. Eager to teach	43. Charismatic
34. Impose unresistable demands if necessary.	39. Praising	44. Well-known
35. Not blame other person's failure or fault	40. Having lots of topics	45. Somehow mysterious
J. Sociableness	*K.* (*Buffer items*)	
46. Kind	51. Love animals	
47. Considerate	52. of high visual acuity	
48. Sociable	53. Run fast	
49. Impartial	54. Good at swimming	
50. Cooperative	55. Love blue color	

2) Data collection tool (Mentor Rating). Based on a pilot survey, 50 items were chosen for making the rating scales of characteristic attributes (personality traits or abilities) of 'Mentor' or 'Excellent Teacher'. The items can be clustered into 10 categories. (See Table 1). In order to eliminate unreliable responses, 5 buffer items were added. This is a version of the semantic differential method.

3) Procedure. As in the case of VIP Questinnaire in Study 1, Menter Rating was administered during a regular classroom teaching hour. After a brief explanation on the study, each item (rearranged in a random order) was read twice rather slowly and the subjects were asked to put down their judgment about the degree how the statement of each item is applicable or relevant as a characteristic trait or an ability of a mentor or an excellent teacher.

4. Results and Discussion.

A. Study 1.

1) The basic attributes of the VIPs named by the subjects are summarized in Fig. 1~Fig. 4. Fig. 1 shows a distinctive sex difference in the proportion of subjects who named opposite sex associates in that female subjects named more male associates. The real reason for this finding is not clear from the present study, but it might be explained, at least to some extent, by the fact that the proportion for secondary school teachers to be named is rather high as Fig. 4 shows, and that male/female ratio of teachers in Japanese secondary schools is unproportinally in favor for male. From Fig. 2, 3, & 4, it is evident that friends at secondary school levels occupy highest percentage. This result supports the findings reported at the ISSBD's 10th Meetings at Jÿvaskÿla (Wakai, 1989).

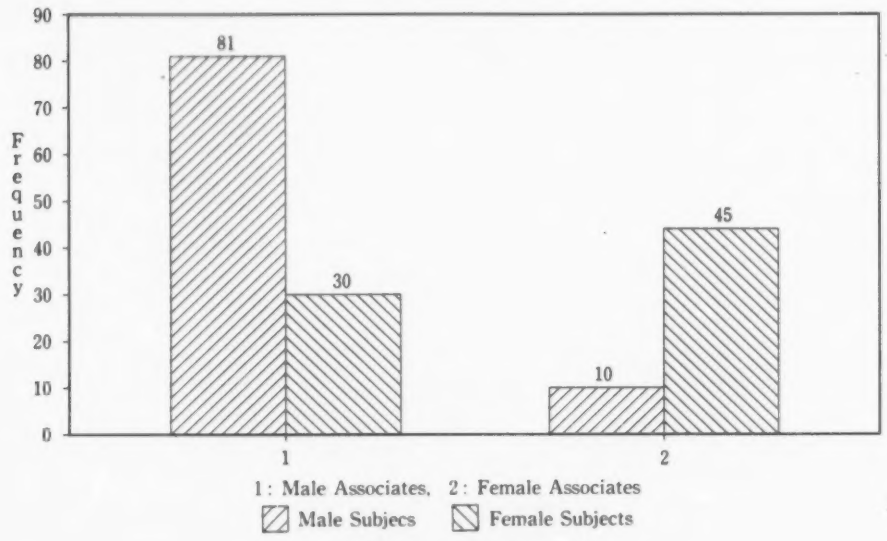

FIGURE 1 Associate's Sex

2) Reasons for VIPs. Fig. 5 shows a summarized pecture of the reasons the subjects gave for naming a particular parcular person as a VIP. The overall tendency is very alike for both sexes of subjects, and it is notable that the reasons represented in the category Code No. 3~7 occupy relatively high percentage. The fact that Code No.

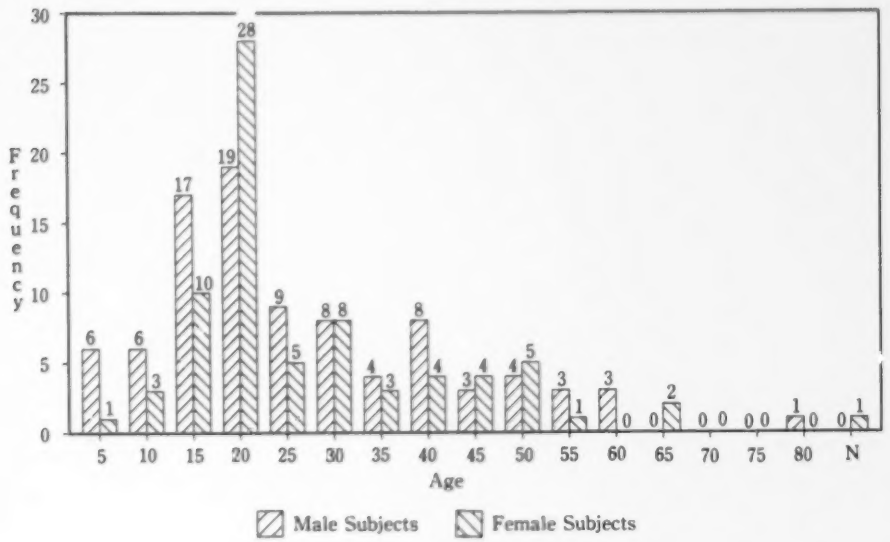

FIGURE 2 Associate's Age

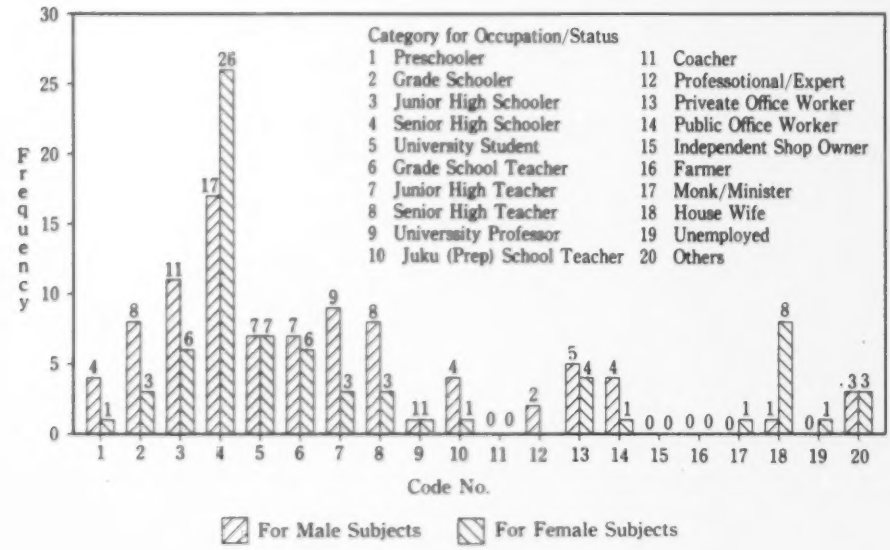
Frequency
Code No.
Category for Occupation/Status
1 Preschooler
2 Grade Schooler
3 Junior High Schooler
4 Senior High Schooler
5 University Student
6 Grade School Teacher
7 Junior High Teacher
8 Senior High Teacher
9 Universsity Professor
10 Juku (Prep) School Teacher
11 Coacher
12 Professotional/Expert
13 Priveate Office Worker
14 Public Office Worker
15 Independent Shop Owner
16 Farmer
17 Monk/Minister
18 House Wife
19 Unemployed
20 Others
4 1 8 3 11 6 17 26 7 7 7 6 9 3 8 3 11 4 1 0 0 2 5 4 4 1 0 0 0 0 0 1 1 8 0 1 3 3
For Male Subjects
For Female Subjects

FIGURE 3 Associate's Occupation

3 (Specific Instruction) shows the highest percentage indicates that teachers are often named as VIPs, and that because the subject's responses are based on specific experience with the teachers in daily teaching/learning situation, thus making it much easier to bring the reasons into awareness. High percentages for Code No. 6.(Companion/

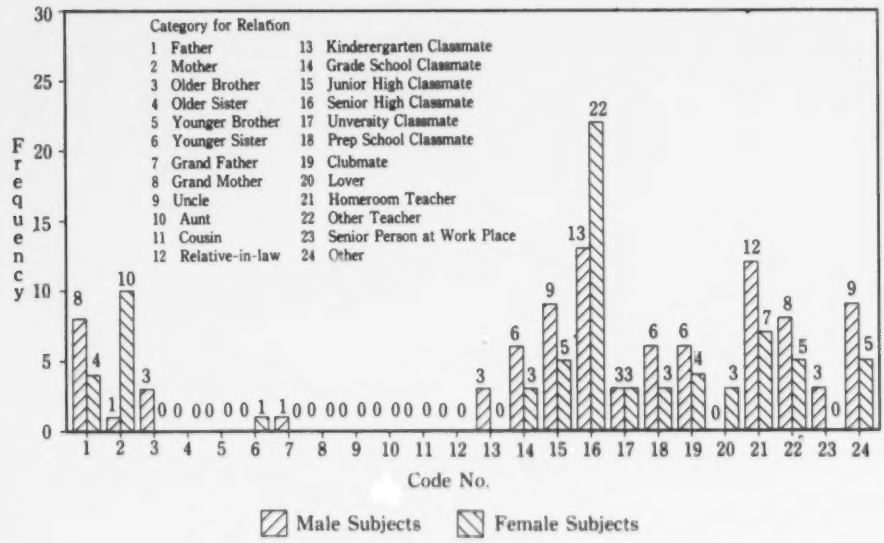

FIGURE 4 Relation

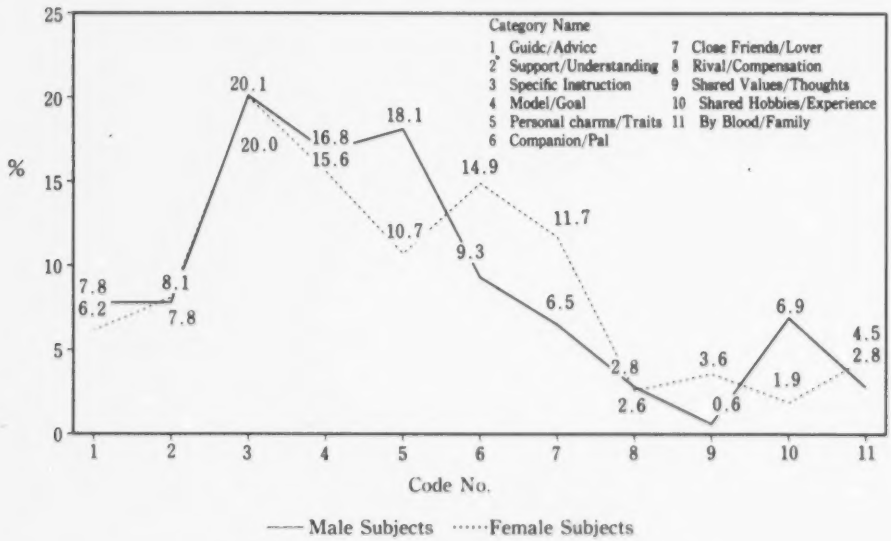

FIGURE 5 Reasons For Naming People As Important

Pal), 7 (Close Friends/Lover), and 10 (Shared Hobbies/Experience) may imply that the subjects 'treasure' their friends.

B. Study 2. For the convenience of data analysis. 50 male and 50 female sub-

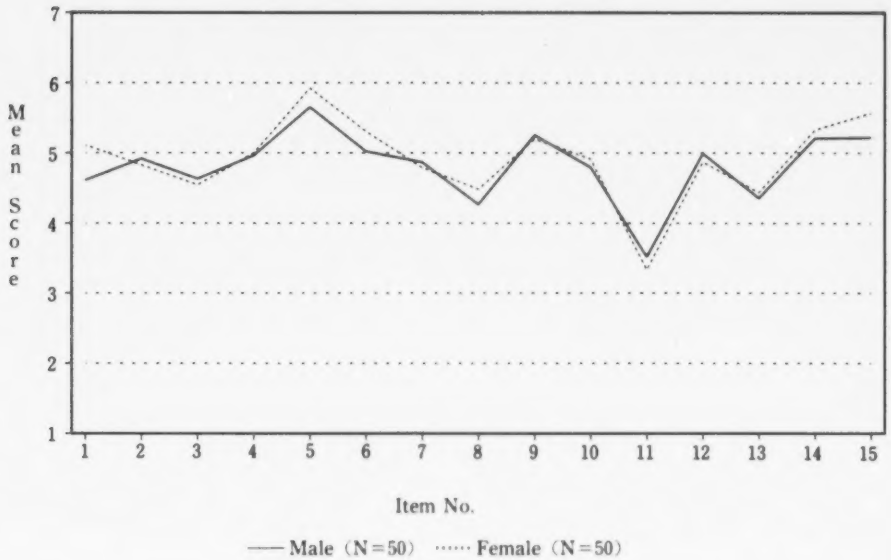

FIGURE 6 Mentor Traits: Item 1-15

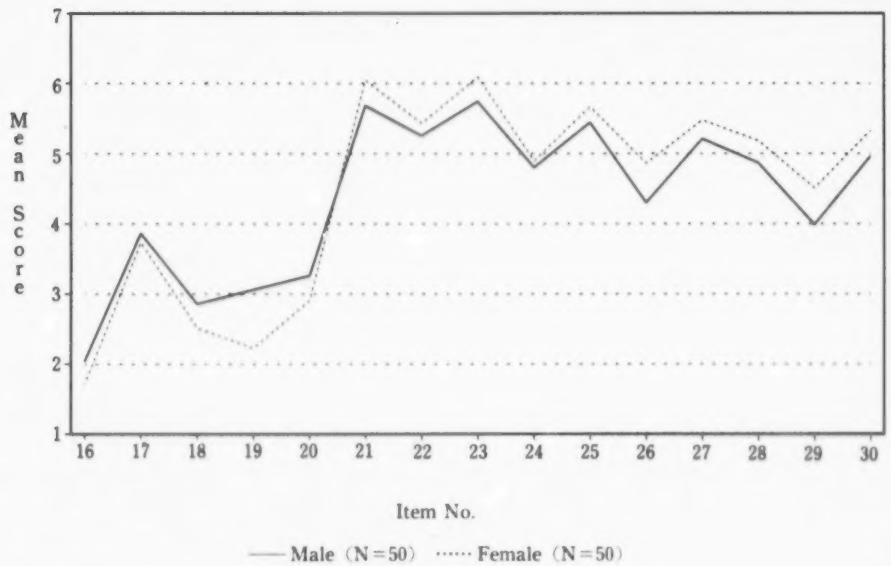

FIGURE 7 Mentor Traits: Item 16-30

jects were selected by eliminating the incomplete and/or widely biased responses of the VIP ratings. Fig. 6~9 shows the results of calculation of mean on each item for both sexes of the subjects. From the figures it appears that attitudes towards other people reflected in the items such as 'Impartial'•(Item No. 49), 'Considerate' (No. 47). 'Listen

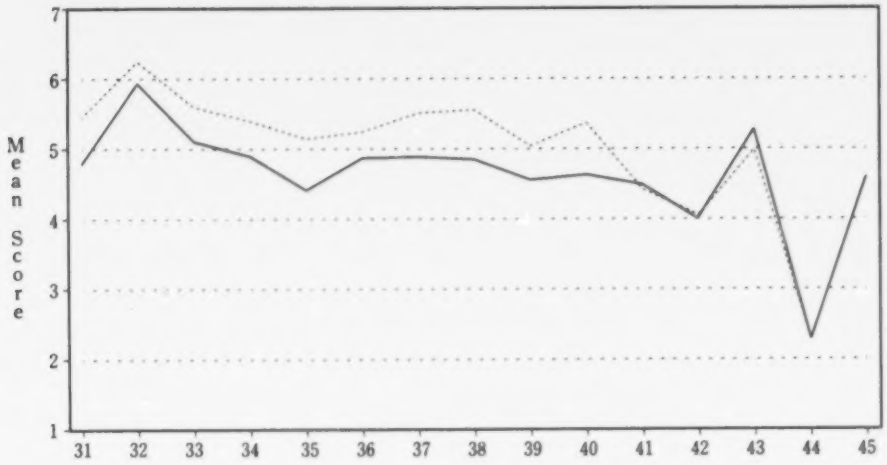

FIGURE 8 Mentor Traits: Item 31-45

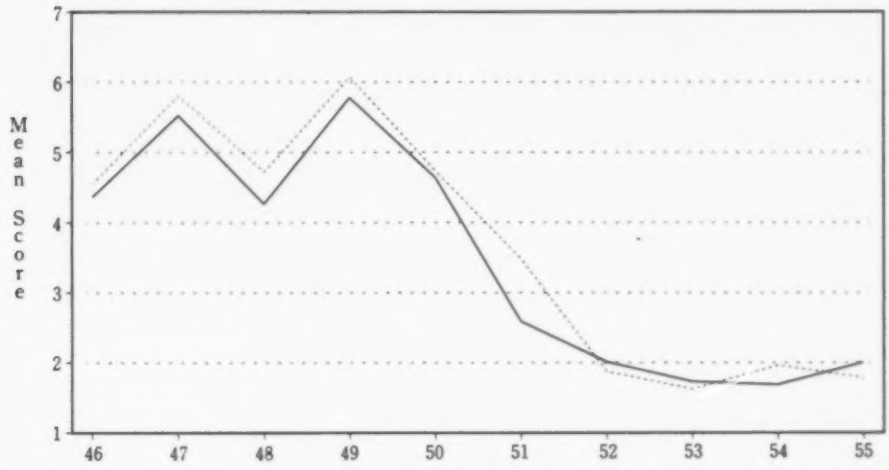

FIGURE 9 Mentor Traits: Item 46-55

to faithfully' (No. 32) are important attributes of mentors or excellent teachers (hereafter, 'mentor' will be used for representing both). Personal traits such as 'Having own firm ideals' and 'Having things to engage in' are also regarded as essential attributes of mentors. These results may be taken as a reflection of what the subjects wish for or idealize as basic aspects of mentors. The results may also be based on their real experience they have come into contact with mentor type of the teachers.

The results on Item No. 41~45 are rather discrepant from what we anticiated. In particular, the mean scale score on Item 44 ('Well-known') was unexpectedly low. On Items 33 to 40, female subjects gave higher scores, which may imply that they expect more 'closeness' of mentors than the male subjects.

For years in the past, the present author has collected short reports on 'Classroom Activity in Memory and Unforgettable Teachers' from college students. The total number of the report is well over 500 hundreds. Statistical analysis has not done yet, but what the students describe in the report is really intriguing and suggestive for examining the role of mentors. As an example of teachers who stay vivid for long in heart of students, a report brought by a female student will be introduced below.

> My elementary school was a small one in a rural village and the number of children in our grade was only seven in all. Our music teacher would greet us at the door of the music room before every class. And it was a kind of his habit to say something briefly to each of us, shaking hands. It was one of our pleasures at the time and I used to wash my hands before the music lesson or I thought over what the teacher would say to me this time.
>
> When we were second graders, we learned the song, 'Yuyake Koyake' (which may be translated into 'Evening Glow, Sunset Blaze'). After we somehow learned, the teacher said to us, "There are various sounds in this song, you know. Tell me how many." We talked each other and identified the sounds of a 'Temple Bell', 'Craw Cry', 'Footsteps of Children Coming Home' in the first piece. From the second, we took out the sounds of 'Children's Footsteps', 'Shines of Bright Moon', 'Dreams of Birds', and 'Twinkles of Stars'.
>
> Then the teacher said to us, "Let's try to make these sounds using the music instruments and record it on a tape with the song you sing." What a wonderful thing it is to record a song we sing! This made us so pleased and excited. And it was a real joy to play the instruments-particularly the percussion instruments. Then we started to examine all the sounds, one by one, talking each other, "What shall we do for making this sound."
>
> Because there was a temple nearby our school and many craws were around us, the sounds of 'Temple Bell' and 'Craw Cry' were to be recorded on a tape by the teacher. The sounds of 'Footsteps of Children', 'Shines of Bright Moon', 'Dreams of Birds', and 'Twinkles of Stars' were decided to be made by the instruments, and the task of choosing the instruments was left to our care.
>
> We proposed ideas each other and got excited with the discussion on which instrument we should use to make each of the sounds. We discussed over and over, and being accompanied by the piano our teacher played we tested how the sounds on the instruments we chose match with the sounds we wanted. And finally, all the

sounds came to be in tune with the instruments.

During the long course for us to reach to the end, our teacher never tried to intervene in our discussion and kept watching queitly the process

Consequently, we decided to use a 'mokugyo' (a wood block) for the sound of 'Footsteps of Children' (beating softer as the footsteps gradually get away), a triangle for the sounds of 'Dreams of Birds', a big drum for 'Shines of Bright Moon' (keeping beating it all long while we sing the song, because the moon is supposed to be shining all at night). The sounds of the 'Twinkles of Stars' were decided to be made by small bells in that several children use them in order to give the impression that many stars are twinkling.

In the next class, the teacher brought the tape on which he recorded the sounds of the 'Temple Bell' and 'Craw Cry', and at last we came to play all the things.

As for the allocation of the instruments, one child took the part of the 'mokugyo' ('Footsteps of Children'), the other one was for a triangle, and the third child was for a big drum. The remaining four took the role of playing small bells. While we sang the song all together, each of us made the sound by the given instruments on each turn. I was assigned for the sounds of twinkling stars, so I shaked my bell when we sang the part, "In the sky, twinkle, twinkle, silver stars." And after we had rehearsals twice, we recorded our play on a tape.

Upon completing the recording, we listened again to it all together. When it came to the end, our teacher clapped hands. Being allurred, we clapped hands too, with vociferous cheers in unison. The joy at the time is never forgettable. And the teacher said to us, "This is your own 'Yuyake Koyake', which is never found in other place in the would."

Later the teacher made cpies of the tape and gave one to each of us. Still now, when I hear the song, I feel myself very excited, feeling as if I am hearing the sounds in the class, and the excitment when we listened to the tape wells up in my heart.

we, seven in number,,,eight with our teacher, do have our own 'Evening Glow, Sunset Blaze', only one in the world, which no one else

Reading this short report for the first time, it was almost hard to believe for the present author that there is (was) really such a wonderful teacher who can make the students so engaged in their learning. From the story, the readers may easily imagine that the students are enjoying discussion friendly and serious as well. And behind the scene, we could see the teacher's kind eyes looking at them warmly. Children try to exercise their wisdom in order to find the ways for appropriate musical instruments to represent 'Twinking Stars', 'Shining Moom' and 'Dreams of Birds'.

Initially this report was brought woth no title. If one wants to give it a title, 'Sounds of Dreams of Birds' might be appropriate. This brief story tells us much about the basic characteristics of mentors such as 'warmth', 'dedicatedness', 'respectfulness', 'psychological closeness', etc. By conducting systematic content analysis of all the reports collected, a more comprehensive picture will be obtained on mentors.

5. Summary and Conclusion

In order to apply more direct probes into 'significant others' (VIPs) and conceptual framework on 'mentors' for comtemporary Japanese college students, two ques-

tinnaire surveys were conducted. It was found that peers at secondary school levels are most frequently named as VIPs, and that one of the most frequent reason for the naming is the associates' 'Supportive and Understanding' attitude towards the subject. Secondary school teachers are also often referred to as VIPs because they taught many things and played the roles of 'Models or Goals in Life' for the students.

By using a semantic differential type of analysis on mentors, it was revealed that 'Impartial', 'Considerate', and 'Listen to faithfully' are mentioned as the most important and relevant characteristics of the mentors. These results provide facts, but it is important to note that the results are not necessarily the true objective picture of 'Mentors'. Two studies reported here left us several interesting findings and lessons. Among the tasks for our future study is to continue our pursuit by paying more careful attention to the key words under consideration and by employing multiphasic and intensive approach.

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執筆者紹介（掲載順）

陳　　宏　圖（心理学科博士課程・カリフォルニア大学バークレー校、アメリカ）
金　澤　克　美（教育学研究科博士課程・北海道大学）
後　藤　恵美子（教育学研究科修士課程・北海道大学）
後　藤　　守（教授・北海道教育大学札幌校）
中　野　　茂（教授・藤女子短期大学）
七木田　　敦（助手・兵庫教育大学）
山　田　憲　政（助教授・北海道大学）
若　井　邦　夫（教授・北海道大学）

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